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NORTH AMERICAN

HERPETOLOGY;

OR,

A DESCRIPTION

OF THE

REPTILES INHABITING THE UNITED STATES.

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INTRODUCTION.

I have, in offering a third volume of the North American Herpetology to the public, to acknowledge many services rendered me by the following gentlemen.

To Dr. Harlan I am indebted for the free use of his private collection of reptiles, his library, &c.

Drs. S. J. Morton and E. Hallowell, of Philadelphia, have also materially assisted me in some interesting anatomical investigations, which will appear in the last volume.

To Dr. W. Blanding, formerly of Camden, S. C., but now of Philadelphia, I am also greatly obliged for several undescribed reptiles, from the south as well as the west; especially for a new and beautiful specimen of Cistuda.

To Professor Green, also of Philadelphia, I am indebted, not only for much information on the reptiles generally, but for the use of his library, museum, and many valuable unpublished notes on the Salamanders.

I have to offer my thanks also to Drs. Binney and Storer, of Boston, for having furnished me with several new Salamanders, together with some curious remarks on their habits; and to Dr. Dekay, of New York, who has communicated

to me his observations on the reptiles of that state, as well as given me the use of the drawings done under his direction by Mr. Hill.

With the colouring of this volume I am perfectly satisfied; it has all been done under my direction, and from life, with the exception of the Phrynosoma orbiculare—the only individual of this species that I have seen was brought from Texas by A. Gaillard, Esq.—the Phrynosoma Douglassii, and the Phrynosoma coronata; but for the correctness of the latter I can answer on the authority of Mr. Nuttall, who has observed them in their native country.

The genus Hylodes of Fitzinger has only been provisionally adopted, because the animals referred to it could not be arranged with the frogs. There is no occasion to add a new genus to a list already too long, unless further anatomical investigation shall show it to be absolutely necessary.

Unfortunately I never had an opportunity of seeing the work of Wiegmann, and my quotations from it are through Dumeril and Bibron, and Blainville; by an error of the press his name is spelt Weigmann.

Cistuda Carolina.

1.

On Stone from life by A. Newsom

J. Pearsall Lith. Philad.a

CISTUDA.—*Flemming, Gray, Dumeril.*

Genus Cistuda.—Characters. Shell gibbous, strong; marginal plates twenty-five; sternum oval, covered with twelve plates, bivalve, both valves moveable on the same axis, and joined to each other, and to the shell by ligamento-elastic tissue; anterior extremities with five, posterior with four nails.

CISTUDA CAROLINA.—*Edwards.*

Plate I.

Characters. Head elongated, narrow; upper jaw with a broad hook in front; shell gibbous, carinate, entire; sternum with an entire margin, oval, bivalve, the two valves joined to each other and to the shell by a ligamento-elastic tissue, and moveable on the same axis.

Synonymes. Land tortoise from Carolina, *Edw.*, Glean. Nat. Hist., p. 205.
Testudo carolina, *Lin.*, Syst. Nat., ed. x., vol. i. p. 198.
Testudo carolina, *Lin.*, Syst. Nat., ed. xii., vol. i. p. 352.
Dösen schildkröte, *Bloch*, Schrift. der Berl. Natürf., fr. vii. p. 131.
Checkered tortoise, *Penn.*, Arct. Zool. suppl., p. 79.
Testudo clausa, *Gmel.*, Syst. Nat., Lin., vol. i. p. 1041.
Testudo carolina, *Gmel.*, Syst. Nat. Lin., vol. i. p. 1042.
Testudo clausa, *Schoepf*, Hist. Test., p. 32, tab. vii.
Testudo clausa, *Latr.*, Hist. Nat. Rept., tom. i. p. 139.

Testudo virgulata, *Latr.*, Hist. Nat. Rept., tom. i. p. 100.
Testudo virgulata, *Daud.*, Hist. Nat. des Rept., tom. ii. p. 207.
Testudo carolina, *Daud.*, Hist. Nat. des Rept., tom. ii. p. 207.
Testudo clausa, *Daud.*, Hist. Nat. des Rept., tom. ii. p. 208.
Testudo clausa, *Shaw*, Gen. Zool., vol. iii., part i., p. 32, pl. 7.
Terrapene clausa, *Merr.*, Versuch. eines Syst. der Rept., p. 28.
La Tortue à boite, *Bosc*, Nouv. Dict. d'Hist. Nat., tom. xxxiv. p. 266.
La Tortue à gouttelettes, *Bosc*, Loc. Cit., p. 266.
Emys clausa, *Schweig.*, Prod. Arch. Königsb., vol. i. p. 315.
Emys virgulata, *Schweig.*, Loc. Cit., p. 316.
Emys Schneiderii, *Schweig.*, Loc. Cit., p. 317.
Emys clausa, *Wägler*, Nat. Syst. der Amph., p. 138.
Cistuda clausa, *Say*, Jour. Acad. Nat. Scien. Philad., vol. iv. p. 214.
Testudo clausa, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 125.
Terrapene carolina, *Bell*, Zool. Jour., vol. ii. p. 309.
Terrapene maculata et nebulosa, *Bell*, Loc. Cit., p. 309–310.
Cistuda carolina, *Gray*, Synop. Rept., p. 19.
Cistuda clausa, *Harl.*, Med. and Phys. Res., p. 149.
Cistudo carolina, *Dum.* et *Bibr.*, Hist. Nat. des Rept., tom. ii. p. 210.
Box tortoise, *Vulgo.*

Description. The shell is extremely gibbous, nearly hemispherical, carinated, and slightly oval, the narrowest part in front. Of the five vertebral plates, the anterior is slightly urceolate and pentagonal, with two of its borders directed forward and outwards; the second, third and fourth are all hexagonal, with their anterior margins a little angular and projecting, and their posterior slightly concave; the fifth vertebral plate is pentagonal, smaller above, larger below, and joined to four marginal. The anterior lateral plate is triagonal, narrow above, broader and rounded below; the second and third are hexagonal; the fourth is quadrilateral and much smaller; sometimes all these plates, vertebral as well as lateral, are marked with concentric striæ. There are twenty-five marginal plates, forming an entire border; the nuchal or intermediate is very small, oblong and narrow, often projecting beyond the rest. The first marginal plate is irregularly pentagonal; the others are all quadrilateral, those over the thighs being broadest;

frequently the eighth, ninth, tenth and eleventh marginal plates, and sometimes the twelfth, are revolute, and form a gutter.

The sternum is oval, with an entire margin, and consists of two sections, of which the posterior is larger; these sections are joined to the shell and to each other by a ligamento-elastic structure, so that both valves are moveable on the same axis, and can be brought in contact with the carapace, and thus conceal the head, neck, extremities and tail of the animal. The gular plates are triangular, with their bases forwards; the brachial and thoracic are quadrilateral, the former the most regularly so; the abdominal are quadrilateral and large; the femoral and subcaudal plates are triangular, the former with their apices truncate.

The head is small; the nostrils anterior and closely approximated. The eyes are large; the pupil black, the iris varying from golden to red or gray. The upper jaw has a broad hook, and the lower is furnished with a small one in front.

The anterior extremities are short, rounded, and covered with large scales in front and smaller behind; there are five fingers, palmated, and each furnished with a short, thick, slightly curved nail. The posterior extremities are rounded above, but flattened at the tarsus, and covered with small scales, having only a few large ones behind; there are five toes, palmated, four only of which are furnished with nails. The tail is very short and thick.

Colour. In no other tortoise is there such a great variety in the colour and markings of the shell; I have seen more than one hundred living specimens together, and could not select two precisely alike. Perhaps the most ordinary colour of the shell is yellowish-brown, with spots or stripes of bright yellow; sometimes these are subradiating, or even radiating; at others they are disposed without order; occasionally there is an entire vertebral line of bright yellow, but most frequently it is interrupted with black. This arrangement of the colours often gives to the carapace the appearance of tortoise shell.

The sternum varies quite as much as the carapace in colour; sometimes it is nearly black; most commonly, however, it is yellowish, with blotches of black or dusky brown.

The head is dark brown above, and marked with yellow spots or lines; the jaws are horn colour, dotted with yellow spots or traversed by yellow lines. The neck above is dusky, below it is dirty yellow, with a few red or yellow spots or stripes.

The anterior extremities are dusky in front, with a few large yellow scales; behind they are clouded-yellow. The posterior extremities are coloured like the anterior, but have fewer yellow spots in front, and are frequently entirely yellow behind. The tail is dusky above, and marked with yellow spots or stripes; beneath it is clouded-yellow or reddish-brown.

Dimensions. Length of shell, $6\frac{1}{2}$ inches; breadth of shell, $4\frac{1}{2}$ inches; elevation, $2\frac{3}{4}$ inches; length of sternum, 5 inches 10 lines.

Habits. The Cistuda clausa is entirely a land animal; indeed, it is so bad a swimmer, that it will drown at the end of a few days if thrown in water. In the southern states they are always found in dry places, and are very numerous in the immense pine forests of that country, and are hence frequently called pine barren terrapin, or *cooter*, by the negroes—a word probably of African origin, there applied to some similar animal. It feeds on insects, crickets, &c., and according to Leconte, on fungous plants, as the clavaria, &c. When in confinement, and it can be easily domesticated, it eats readily whatever is offered, as bread, potatoes, apples, &c. It may well be doubted whether they destroy mice or serpents for their food, as was believed by Bose and Henry Muhlenberg; yet it is not impossible that an unwary snake or mouse might, by approaching too near the animal, be accidently caught and held between the sternum and carapace, as the animal will close itself upon anything that annoys it. We should not suppose, however, that objects thus caught are its natural food.

Geographical Distribution. The Cistuda carolina is found from one extremity of the Union to the other. I have seen it in all the Atlantic states, even as far north as Maine, and have received specimens from Florida, Alabama and Louisiana. Dr. Pickering observed it in Ohio, and Say as far west as the Engineer cantonment on the Missouri.

General Remarks. The first notice of this animal is to be found in the "Gleanings of Natural History," by George Edwards, who has given a very good figure of it, done from a living specimen sent him by Alexander Light, Esq., of South Carolina. He observes that the sternum is "divided in two at the middle of the belly," and that "these two pieces are attached to the shell by a skin, strong, tough, and flexible," which gives to the animal "the power to close itself as firmly as an oyster." The figure of Edwards is only faulty in being without a tail; although in his description he speaks of a tail "very short, with the vent opening near the extremity." Linnæus next gave it a place in the tenth edition of his Systema Naturæ, under the name Testudo carolina; of this there can be no doubt, as his only reference is to the Testudo tessellata, carolina, &c. of Edwards.*

Gmelin did great harm to the science of Herpetology by receiving, in his edition of the Systema Naturæ, as a new species, under the name Testudo clausa, the tortoise described by Bloch,† which is certainly the Testudo carolina of Linnæus. He has thus most unnecessarily increased the catalogue of synonymes, by describing the same animal twice under different names. Schoepf is still more to blame for adopting this name of clausa; the more so, as he was fully aware, as may be seen by his own remarks and references, of the identity of the Testudo carolina of Linnæus and the Testudo clausa of Gmelin. Thus, he gives as references, in the description of the Testudo clausa of his work, the Testudo carolina of the tenth edition of the Systema Naturæ of Linnæus; and furthermore,

* See North American Herpetology, vol. i. p. 45.

† Schrift. der Berl. Natürf., fr. 7, p. 131, tab. i.

he excludes the references to Gronovius and Seba, given in the twelfth edition. After all, the name of clausa is no more characteristic than that of carolina, though apparently so at first sight, for the power of closing the shell as firmly, belongs equally to the C. amboinensis and C. trifasciata of Gray, as to the C. clausa of Gmelin; yet from Schoepf's high authority as a Herpetologist, most others have in this followed his example. I am glad, however, to see lately such excellent Herpetologists as Gray and Bell in England, and Dumeril and Bibron of Paris, adhere to the old specific name of carolina for this animal.

Although the form of the Cistuda carolina, as well as the colour and markings of its shell, differ so much as has been said above, yet they can all be arranged under certain varieties. Leconte has them as follows:

"α. Very dark brown, obscurely spotted with yellow, with a few radiating lines of the same; sternum very dark brown, with a few blotches of yellow; top of the head yellow; jaws varied with yellow and black; neck yellowish-cinereous, spotted with yellow.

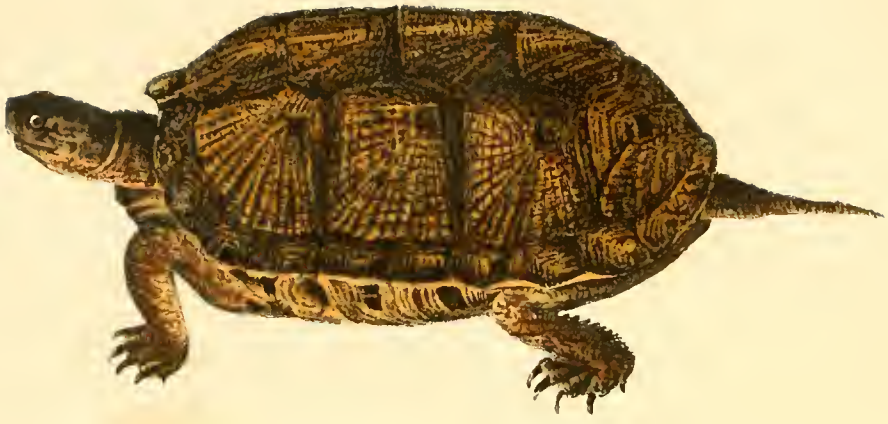
"β. With larger and more distinct spots of yellow, some of them confluent and subradiating. Sternum yellow; jaws yellow, striped with black; top of the head mostly yellow; sides of the neck black, striped with yellow; throat yellow, varied with black.

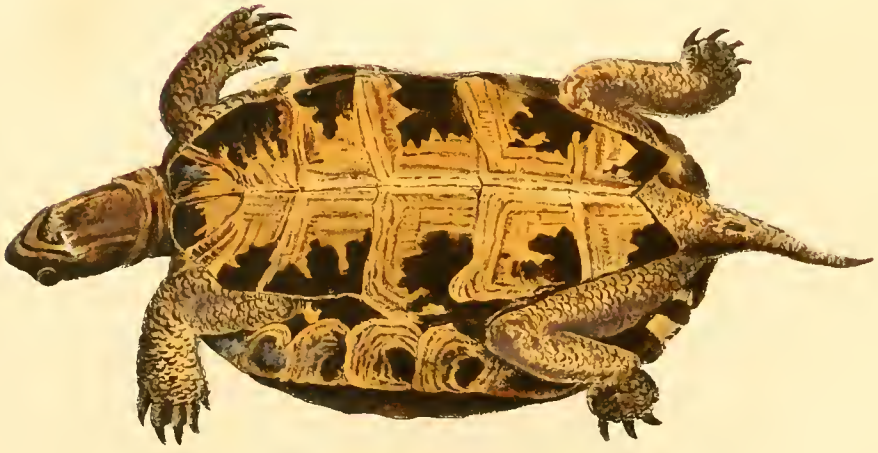
"γ. Shell brown, the plates marked with concentric striæ, and with numerous round and oblong spots of yellow; keel yellow; sternum yellow, unspotted; head and neck black, spotted above, and varied on the sides with orange; chin and throat yellow; jaws yellow, the upper one slightly marked with brown. This is the Testudo virgulata of Daudin, and the description was made from the very specimen he possessed, compared with three others.

"δ. Smooth, yellowish-brown, with a few indistinct spots of dark brown; sternum yellow, unspotted; skin cinereous-brown; fore legs darker; top of the head yellowish;

jaws orange, the lower one marked with one or two dusky spots, sometimes unspotted; chin and throat yellowish, rarely marked with a few spots of dusky; hind legs and tail unspotted.

"ε. Shell and sternum entirely very dark brown, without spots; plates deeply marked with concentric striæ."





Emys insculpta

2

On Stone by G Lehman

Lehman & Duval Lith.rs Philad.a

EMYS INSCULPTA.—*Leconte.*

Plate II.

Characters. Shell oval, carinate, emarginate posteriorly; reddish-brown, with radiating yellow lines; sternum full in front, emarginate behind; all the plates deeply marked with radiating and concentric striæ.

Synonymes. Emys scabra, *Say*, Jour. Acad. Nat. Scien. Philad., vol. iv. p. 211.
Testudo insculpta, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 112.
Emys scabra, *Harl.*, Jour. Acad. Nat. Scien. Philad., vol. vi. p. 26.
Emys speciosa, *Gray*, Synop. Rept., p. 26.
Emys insculpta, *Harl.*, Med. and Phys. Res., p. 152.
Emys pulchella, *Dum.* et *Bibr.*, Hist. Nat. des Rept., tom. ii. p. 251.

Description. The shell is oval, carinate and emarginate posteriorly. There are five vertebral plates; the anterior is pentagonal, broad, with an acute angle and two borders in front, narrow behind, with its posterior margin slightly concave to fit the adjoining plate; the second and third vertebral plates are hexagonal; the fourth is heptagonal, and very narrow posteriorly; the fifth is again hexagonal, with four of its articulating facets directed backwards. Of the lateral plates, the anterior is triangularly hexagonal and united to four marginal plates; the second and third are hexagonal, the latter very irregularly so; the fourth is quadrilateral; the fifth is hexagonal, smaller above, larger below. All of these plates, as well as those of the vertebral range, have a well developed prominence in the centre, from whence pass radiating striæ, which are again crossed by concentric striæ, giving a beautiful sculptured appearance to the shell. The marginal plates are twenty-five; the nuchal or intermediate is small and narrow,

but elevated like a carina or ridge above the adjoining plates; the anterior marginal is pentagonal, with its outer and anterior angle prolonged; all the others are quadrilateral: those along the flanks are revolute and form a groove; the ninth and tenth are convex, while the eleventh and twelfth are again revolute and form a deep gutter; the posterior and external angles of the ninth, tenth and eleventh are each prolonged, and give a subserrate appearance to the posterior margin of the carapace.

The sternum is oblong, full and entire in front, but deeply emarginate behind; the gular plates are triangular, with their apices directed backwards, and projecting beyond the brachial at their external border; the brachial are also triangular, with truncate apices; the thoracic are oblong, quadrilateral; the abdominal are pentagonal, large and broad. The femoral plates are quadrilateral, very large, and project beyond the subcaudal at their posterior and external angles; the subcaudal are lozenge-shaped. The surfaces of all these, as well as the inferior surface of the marginal plates, are marked with deep radiating and concentric striæ. Of the supplemental plates, the axillary is triangular, with its basis turned backwards; the inguinal is quadrilateral and very small.

The head is large, but elongated; the upper jaw emarginate in front, and the lower furnished with a strong hook; the cutting edges of both are strong and sharp. The nostrils are anterior, and near together. The eyes are large, with a black pupil, and a dark brown iris, surrounded by a yellow circle.

The anterior extremities are covered with scales, both before and behind, those in front being the largest; there are five fingers, palmate, each furnished with a short, strong, and slightly curved nail. The posterior extremities are rounded at the thigh, but flattened at the leg and tarsus; there are five toes, fully palmate, but four only are furnished with nails. The tail is long, thick at the root, but soon becomes slender, and is covered with scales.

Colour. The head is dusky above, lighter below, and speckled with red, or

has a general tinge of brick-dust colour. The jaws are horn colour; the chin reddish-brown, with a transverse white line near the posterior extremity of the lower jaw.

The shell above is brown, marked with radiating yellow lines. The marginal plates beneath are yellow, with each a black spot, and most commonly with concentric dusky lines. The sternum is also yellow, with a very large black blotch and concentric striæ to each plate. The extremities, anterior and posterior, as well as the tail, are reddish-brown above and brick-dust colour below.

Dimensions. Length of shell, 8 inches; breadth of shell, 5 inches; elevation, $2\frac{3}{4}$ inches; length of sternum, 7 inches 5 lines; length of tail, $2\frac{1}{4}$ inches.

Habits. The Emys pulchella lives in ponds and rivers, and is, according to Leconte, much more fond of leaving its natural element than any other aquatic species, remaining even for months uninjured in dry places. The living individuals that have fallen under my observation were all from New Jersey; they were very lively and active, and moved rapidly either on land or water. They were very restless, constantly in motion, and seemed disposed on all occasions to attack their fellow prisoners, (E. serrata and E. terrapin.)

Geographical Distribution. The geographical range of the Emys pulchella is much more extended than was at first believed. It inhabits the Atlantic states from Maine to Pennsylvania; the largest specimen I have ever seen was from the former state, and is now in the Museum of the Boston Lyceum of Natural History.

General Remarks. To Leconte is due the merit of having first accurately described this animal, in his Monograph on the North American tortoises, under the name Testudo insculpta. Dumeril and Bibron, however, give the credit to Schweigger, and have consequently adopted his name of pulchella, excluding at the same time the pulchella of Schoepf. Let us see how Schweigger's account agrees with the animal now under consideration, and in what respect it differs

from that of Dumeril and Bibron. Schweigger says:* "The sternum is truncate in front, obtuse or but slightly sinuous behind, and is joined to the shell by cartilage." All this agrees perfectly well with the Cistuda Europea, (Cistuda pulchella of Schoepf,) of which Dumeril and Bibron also remark:† "The sternum, which is oval, &c., has its anterior extremity truncated and its posterior hardly emarginate;" and again, "this sternum, which is, &c. &c., to be united with the shell by means of cartilage." But look for a moment at their account of the Emys insculpta of Leconte, which they suppose identical with the Emys pulchella of Schweigger, and we shall see that they do not agree in the most important particulars. Thus, in their characters of the genus Emys, under which they have very properly arranged the animal in question, they say, "sternum immovable, and solidly articulated to shell;" which is correct; but it neither agrees with Schweigger's description of his pulchella, as may be seen above, nor with their own characters given to the genus Cistuda, under which they arrange the pulchella of Schoepf, (Cistuda Europea.) And again, as regards the form of the sternum—Dumeril and Bibron say with truth of the Emys insculpta, "deeply notched behind like the letter V;" while in Schweigger's account of the pulchella, it is "hardly sinuous."

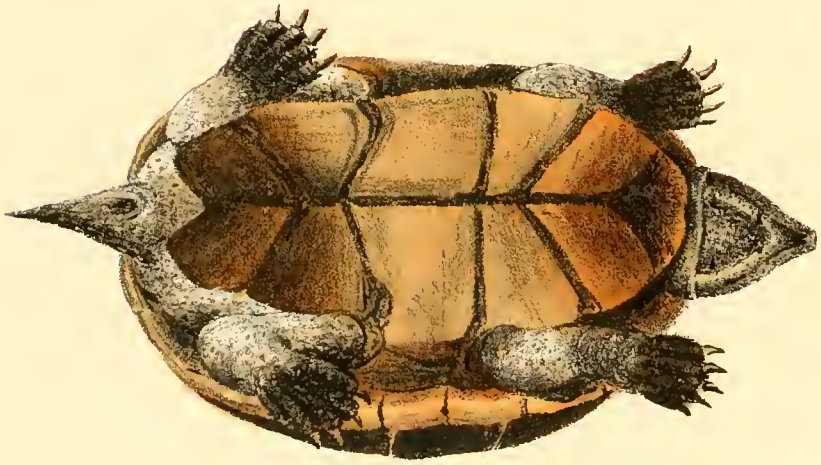
Schweigger had no notion that he was describing a new species of Emys when drawing up the specific characters of the E. pulchella; on the contrary, he supposed that he was continuing the species Testudo pulchella of Schoepf, to whose description he refers; and although he may have seen individuals of the E. insculpta in the Garden of Plants at Paris, as he avers, still his description does not correspond with it in any of the most remarkable points, while it is perfectly applicable to the Cistuda Europea or Testudo pulchella of Schoepf, which

* Sternum duodecim areis; antice truncatum; postice obtusum, levissime sinuatum; cartilagine testæ adnexum, &c. Prod. Arch. Königsb., p. 305.

† Le sternum qui est ovale, &c. &c., a sa partie anterieure comme tronquée et son extremité posterieure à peine echancrée. And again: Ce bouclier inferieure, &c. &c., de chaque coté pour s'unir à la carapace au moyen d'un cartilage, &c. Hist. des Rept., tom. ii. p. 232 et 224.

is only the young animal. It may even be doubted whether Schweigger ever saw the real E. insculpta, for he visited Paris in 1809, and published his Prodromus in 1812; while the specimens in the Garden of Plants are said to have been sent by Milbert, Lesueur and Leconte, from New York, which could only have happened many years after.

It follows, then, from these considerations, that the Emys pulchella of Schweigger is not identical with the Testudo insculpta of Leconte, and that the Emys pulchella of Dumeril and Bibron is; yet their name cannot be retained, as Leconte's has the right of priority.



Kinosternon Pennsylvanicum.

KINOSTERNON.—*Spix.*

Genus KINOSTERNON.—CHARACTERS. Head subquadrangular, pyramidal, covered with a single plate; jaws slightly hooked, warts at the chin, marginal plates twenty-three; sternum subdivided into three sections, anterior and posterior moveable, central fixed; plates of sternum eleven; supplemental plates very large; tail long.

KINOSTERNON PENNSYLVANICUM.—*Edwards.*

Plate III.

CHARACTERS. Head large, upper and lower jaw hooked; shell oval, smooth, ecarinate, entire; vertebral plates depressed, subimbricate; sternum of three pieces, anterior and posterior sections moveable, central section fixed.

SYNONYMES. Testudo lutaria pennsylvanica, *Edw.*, Glean. Nat. Hist., part ii. p. 77, tab. cclxxxvi.
Testudo pennsylvanica, *Gmel.*, Syst. Nat. Lin., vol. i. p. 1042.
La tortue rougeâtre, *Lacép.*, Quad. Ovip., tom. i. p. 132.
Mud tortoise, *Penn.*, Arc. Zool., suppl. p. 80.
Testudo pennsylvanica, *Schoepf*, Hist. Test., p. 107, tab. xxiv. fig. A.
Testudo pennsylvanica, *Latr.*, Hist. Nat. des Rept., tom. i. p. 133.
Testudo pennsylvanica, *Daud.*, Hist. Nat. des Rept., tom. ii. p. 182.
Testudo pennsylvanica, *Shaw*, Gen. Zool., vol. iii. p. 60, pl. xiv. fig. 2.
Le rougeâtre, *Bosc*, Nouv. Dict. d'Hist. Nat., tom. xxxiv. p. 367.
Terrapene pennsylvanica, *Merr.*, Versuch. eines Syst. der Rept., p. 27.
Emys pennsylvanica, *Schweig.*, Prod. Arch. Königsb., vol. i. p. 155.

Cistuda pennsylvanica, *Say*, Jour. Acad. Nat. Scien. Philad., vol. iv. p. 216.
Testudo pennsylvanica, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 120.
Kinosternon pennsylvanicum, *Bell*, Zool. Jour., vol. ii. p. 304.
Kinosternon pennsylvanicum, *Gray*, Synop. Rept., p. 33.
Cinosternon pennsylvanicum, *Wag.*, Natürlich. Syst. der Amph., p. 137.
Emys pennsylvanica, *Harl.*, Med. and Phys. Res., p. 155.
Mud tortoise, *Vulgo.*

Description. The shell is oval, gibbous, though a little flattened along the vertebral line, with an entire or slightly notched margin posteriorly. There are five very large vertebral plates; the anterior is long, narrow and triangular, with its basis forward, and its apex truncate and directed backwards, and having a slight prominence in the middle; the second, third and fourth are hexagonal, with their anterior angles rounded and their lateral angles acuminate; the fifth is irregularly quadrilateral, smaller above and larger below, where it joins four marginal plates: all these vertebral plates are more or less imbricate posteriorly. Of the lateral plates, the anterior is irregularly quadrilateral; the second and third are pentagonal and acuminate where they join the vertebral plates; the fourth is pentagonal. The marginal plates are twenty-three in number; the nuchal or intermediate is an oblong square, small and narrow; the first, second and third are quadrilateral, narrow and elongated; the remaining marginal plates are quadrilateral and broader; the tenth with unequal margins.

The sternum is shorter than the carapace; it is oval, rounded, and full in front, and emarginate behind. The gular plates are consolidated to form a single plate, which is triangular, with its apex posterior; the brachial are quadrilateral; the thoracic are triangular, with their apices turned inwards: these five plates are all united firmly together and form the anterior section of the sternum, which is so joined by ligamento-elastic tissue to the abdominal plates as to form a hinge joint. The abdominal plates are large, quadrilateral, and fixed to the shell; the femoral are triangular and the subcaudal are quadrilateral: these four latter plates are united to each other and form the posterior section of the sternum, and are joined to the posterior border of the abdominal plates by a ligamento-elastic tissue,

which allows of certain motions. The supplemental plates are triangular, the posterior very large.

The head is large and rather pointed at the snout; the nostrils are anterior. The eyes are large, the pupil dark, the iris dark gray, with a very narrow border of light gray around the pupil. The upper and lower jaws are very strong, and both are furnished with a hook in front. The neck is long, rather slender; the skin above is covered with small warts, and the throat with larger. There are four very remarkable warts about the lower jaw; two of these are placed at the chin, and two under the angle of the mouth.

The anterior extremities are short, rounded, and covered with a warty skin, and having two transverse rows of large scales in front, with some large scales near the tarsus behind; there are five fingers, palmate, each furnished with a short nail. The posterior extremities are elongated, much flattened at the tarsus, and covered with a minute warty skin, and eight or ten large scales near the ankle and tarsus; there are five toes, fully palmate, the four internal ones only are furnished with nails. The tail is very short, thick at the root, pointed and horny at the tip.

Colour. The shell is of a universal dusky brown colour above. The sternum varies a good deal; sometimes it is dusky, with a yellowish tinge, and has darker lines at the junction of the plates; at others it almost approaches a dark chestnut colour.

The head is nearly black above, and dusky at the sides, freckled with minute yellowish spots. The jaws are horn colour, with delicate waving dusky lines. The neck is dusky above; the chin and throat are of dirty yellow, with the larger warts of brighter yellow.

The extremities and tail are dusky above, and clouded or dirty yellowish-white below.

Dimensions. Length of shell, 3½ inches; breadth of shell, 2 inches 10 lines; elevation, 1¾ inches; length of sternum, 3 inches 2 lines.

Habits. The Kinosternon pennsylvanicum abounds in ponds or muddy pools, feeding on small fish and such other aquatic animals as it can secure. It takes the hook readily, and is therefore very troublesome to anglers; seizing the bait so cautiously, that it is frequently some minutes before it is fairly hooked, when it struggles violently. The living animal has a slight odour of musk that is not disagreeable.

Geographical Distribution. The Kinosternon pennsylvanicum is found in the Atlantic states from Cape Florida to latitude 41°; beyond this I have not heard of its existence; and Hitchcock, in his Geology of Massachusetts, probably mistook the Sternothærus odoratus for the Kinosternon pennsylvanicum. It is also abundant in the west; Troost has observed it in Tennessee and Kentucky, and Say has seen it high up the Missouri.

General Remarks. Edwards first described this animal from a specimen furnished him by John Bartram, of Pennsylvania, and gave of it three figures in his Gleanings of Natural History. These figures were done from life; and although they are not very beautiful, yet they are sufficiently accurate, and have been copied by several Naturalists. Although this may be considered as the earliest notice of the animal, yet the first full and accurate description is in the Historia Testudinum of Schoepf, taken from an individual sent him by Muhlenberg, also of Pennsylvania.

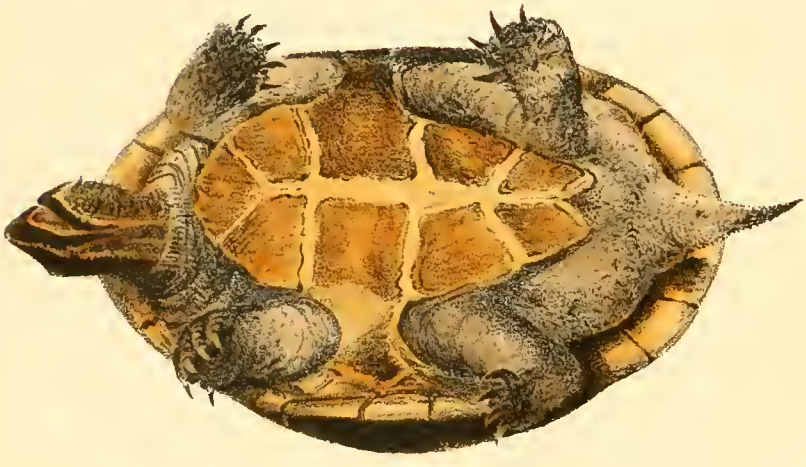
Naturalists have experienced some difficulty in assigning the Kinosternon pennsylvanicum to its proper place. Brogniart first separated it from the genus Testudo and referred it to that of Emys, to which it certainly does not belong. Flemming* next placed it in the genus Cistuda, established by himself, with the

* Philosophy of Zoology, vol. ii. p. 270.

Cistuda carolina, &c.; but here the anatomical characters are greatly at variance,* for in the Kinosternon pennsylvanicum, as seen above, it consists of three parts, the central section fixed, the anterior and posterior moveable; while in the genus Cistuda the sternum has but two valves, both equally moveable on the same axis.

Spix afterwards established the genus Kinosternon upon the characters given above for a South American tortoise, under which the animal here described ranges very well.

* See the anatomical part of this work for a full description of the anatomy of this genus.



Sternotherus odoratus.

4.

J. T. Duval Lith. Phila.ª

STERNOTHÆRUS.—*Bell.*

Genus Sternothærus.—Characters. Head subquadrangular, pyramidal, covered in front with a single plate; warts on the chin; marginal plates twenty-three; sternum cruciform, bivalve, anterior valve only moveable; supplemental plates contiguous, placed on the sterno-costal suture; anterior extremity with five nails, posterior with four.

STERNOTHÆRUS ODORATUS.—*Bosc.*

Plate IV.

Characters. Head large, snout pointed; shell oval, entire, slightly carinate; sternum rounded in front, emarginate behind, covered with eleven plates, bivalve, the anterior valve moveable, posterior fixed.

Synonymes. Testudo pennsylvanica, sterno immobile, *Schoepf*, Hist. Test., p. 110.
Testudo odorata, *Bosc*, MSS. communicated to Latreille.
Testudo odorata, *Latr.*, Hist. Nat. Rept., tom. i. p. 122, tab. xxiv. fig. B.
Testudo odorata, *Daud.*, Hist. Nat. des Rept. tom. ii. p. 189, tab. xxiv. fig. 5.
Testudo glutinata, *Daud.*, Loc. Cit., tom. ii. p. 194, tab. xxiv. fig. 4.
La tortue odorante, *Bosc*, Nouv. Dict. d'Hist. Nat., tom. 34, p. 267.
Terrapene odorata, et Boscii, *Merr.*, Versuch eines Syst. der Rept., p. 26.
Cistuda odorata, *Say*, Jour. Acad. Nat. Scien. Philad., vol. iv. p. 216.
Emys odorata, *Schweig.*, Prod. Arch. Königsb., vol. i. p. 437.
Testudo odorata, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. iii. p. 122.

Sternothærus odoratus, et Boscii, *Bell*, Zool. Jour., vol. ii. p. 307, 308.
Kinosternon odoratum, *Gray*, Synop. Rept., p. 55.
Emys odorata, *Harl.*, Med. and Phys. Res., p. 156.
Staurotypus odoratus, *Dum.* et *Bibr.*, Hist. Nat. des Rept., tom. ii. p. 358.

Description. The shell is oblong oval in form, entire, gibbous, more or less carinate and compressed at the sides. Of the four vertebral plates, the anterior is very long and narrow, triangular, with its basis down and its apex upwards and truncate; the second, third and fourth are hexagonal, with their lateral borders acuminate where they join the lateral plates, the two latter with their anterior borders concave and their posterior rounded; the fifth vertebral plate is pentagonal, narrow above and broader below: all these plates are more or less imbricate posteriorly. The anterior lateral plate is quadrilateral, smaller above, large and rounded below; the second, third and fourth are pentagonal, the latter very irregularly so. There are twenty-three marginal plates; the intermediate, or nuchal, is nearly triangular, and extremely small; the remaining plates, to the tenth, are oblong quadrilateral, this and the eleventh are regularly quadrilateral. All these plates are separated from the shell by a groove, more or less distinct, as far as the two last on each side, which are closely united to the posterior lateral and posterior vertebral plates.

The sternum is very small compared with the shell, and is oblong oval, rounded in front, and very deeply emarginate behind. The gular plates are consolidated into one, which is small and triangular, with its apex directed backwards; the brachial plates are also small, triangular, and project beyond the thoracic at their outer and posterior angles. The thoracic are quadrilateral and joined to the abdominal by a ligamentous substance, to allow certain motions, but far less even than in the Kinosternon pennsylvanicum, and in very old animals this joint becomes anchylosed and motion ceases. The abdominal plates are quadrilateral, largest and firmest of all, and are so closely joined to the shell as to admit of but little if any motion. The femoral vary a good deal, sometimes they are nearly quadrilateral, at others they approach a triangular form. The subcaudal

are quadrilateral. Of the supplemental plates, the axillary are very small and triangular; the inguinal are twice as large, and of variable form.

The head is very large, with the snout elongated and very pointed; the nostrils are anterior and near together. The eyes are large, the pupil black, the iris very dark hazel, with an inner circle of yellow. The upper jaw is strong and sharp; the lower jaw is equally strong and recurved anteriorly. There are several warts or barbels near the chin, varying in size; the most remarkable are two at the chin, and two near the posterior extremity of the lower jaw.

The anterior extremities are short and rounded, granulated in front, with two or three large scales near the carpus; there are five fingers, palmate, with each a short nail. The posterior extremities are flattened near the tarsus, and are granulated both before and behind with a few small scales near the tarsus posteriorly; there are five toes, fully palmate, the four internal ones alone are furnished with nails. The tail is very short, thick at its root, narrow at its extremity, and terminating in a small horny point. The skin of the tail is granulate and covered with small warts, disposed in a row along the upper surface like a ridge.

Colour. The shell is black or dusky, mixed and clouded with brown, and at times with a few radiating lines of lighter brown.

The sternum is dirty or clouded yellowish-white, and each plate is sometimes bordered with dusky.

The head is black above and dusky at the sides, with occasional spots of dirty yellow; a yellowish-white line extends, with certain interruptions, from the snout over the eye along the neck; a second line of the same colour runs from below the orbit to the throat. The jaws are horn colour, with waving lines of dusky or dark brown. The skin of the neck above is warty and dusky; the throat is dirty yellow, with many of the larger warts of brighter yellow.

The extremities are dusky above, dingy white below. The tail is dark above, and with its under surface coloured like the extremities.

Dimensions. Length of shell, $3\frac{1}{2}$ inches; greatest breadth, 2 inches 4 lines; elevation, $1\frac{1}{2}$ inches; length of sternum, 2 inches 7 lines.

Habits. The habits of this animal are much like those of the Kinosternon pennsylvanicum; it chooses slow moving or muddy waters, and is very abundant in the ditches of our rice fields, where it feeds on small fish or on smaller reptiles, as the various kinds of tadpoles that inhabit the same localities. It is, however, a much bolder animal, and bites very severely if provoked. When taken alive, it emits a strong and disagreeable odour of musk, much more remarkable than the Kinosternon pennsylvanicum.

Geographical Distribution. Its geographical range is more extended than the last described animal, as it is found as far north as the state of Maine, whence it reaches through middle Florida and Alabama along the western border of the Alleghany mountains, even as far as the Cumberland river in Tennessee, according to the observations of Troost, and is probably found in all the western states.

General Remarks. This is evidently the animal described by Schoepf, in his Historia Testudinum, as a variety of his Testudo pennsylvanica, with an immovable sternum. The individual, he says, was sent him by Muhlenberg, of Pennsylvania, together with a specimen of the true Testudo pennsylvanica, of which he (Schoepf) believed it to be a variety.

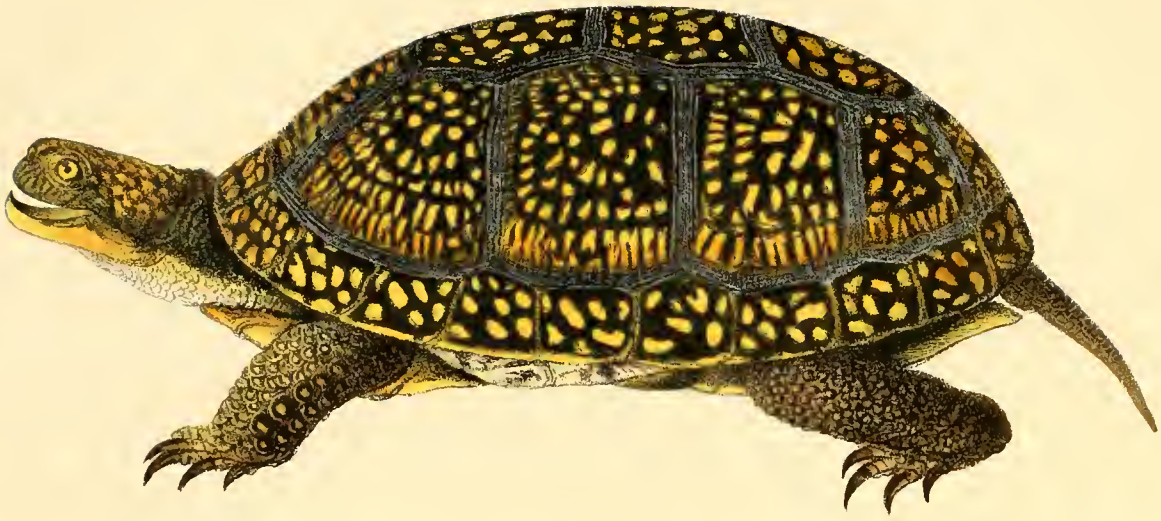
The next notice of the animal now under consideration is in the work of Latreille, where it is called Testudo odorata for the first time by Bosc, who furnished the description, drawn from living specimens that he had observed in Carolina, and the name, no doubt, was given from the odour of musk it emits when alive. Latreille, though he describes the animal on the authority of Bosc, seems

rather to regard it as a variety of the Testudo pennsylvanica, (Kinosternon pennsylvanicum,) than as a distinct species.

Daudin next describes this animal, and from the same authority, but more fully; he places it among those Testudines where the anterior section of the sternum alone is moveable. He says, however, that he "suspects" it is only a simple variety; yet he describes it as a distinct species, in deference to the opinion of Bosc and Beauvais.

Daudin again reproduces the same animal as the Testudo glutinata, which is synonymous with the Testudo pennsylvanica sterno immobile of Schoepf; but still believing it to be a variety of the Testudo pennsylvanica, (Kinosternon pennsylvanicum,) from which, however, the animal is not only specifically but generically distinct.

Say and many Naturalists have referred this animal to the genus Cistuda of Fleming, with which its anatomical characters are entirely at variance; and Dumeril and Bibron have lately arranged it under that of Staurotypus of Wagler, but I see no good reason for removing it from that of Sternothærus of Bell.



Cistuda Blandingii.

5

CISTUDA BLANDINGII.

Plate V.

Characters. Head rather large, upper jaw emarginate in front, lower jaw with a small hook; shell subround, elongated, smooth, ecarinate, with an entire margin; sternum entire in front, deeply emarginate behind, bivalve, posterior valve but slightly larger.

Description. The head is rather large, smooth above, and slightly pointed at the snout; the nostrils are anterior, and closely approximated; the eyes are large and prominent, the pupil black, the iris light gray. The upper jaw is broad, the cutting edge sharp and deeply emarginate in front; the lower is strong and firm, and furnished with a small hook. The neck is long and slightly contracted at the back of the head.

The shell is oblong, rounded, very nearly as broad before as behind, smooth and ecarinate, with an entire margin. Of the vertebral plates, the anterior is broad, pentagonal, with two of its articulating surfaces directed forwards and outwards, and meeting at an angle in front; the second and third are very regularly hexagonal, broadest in the transverse direction—the former very slightly concave in front and the latter as slightly concave behind; the fourth is regularly heptagonal, rather concave posteriorly; the fifth is octagonal, smaller above and larger below. The anterior lateral plate is irregularly quadrilateral, larger and rounded below, smaller and straight above; the second and third are pentagonal; the fourth is smaller and quadrilateral. There are twenty-five marginal plates, making an entire cutting margin; the intermediate or nuchal is of moderate size and nearly a

parallelogram, being only slightly notched on its posterior margin to receive the point of the first vertebral plate; the first marginal plate is regularly quadrilateral, the second pentagonal, the third and fourth quadrilateral, the fifth pentagonal, the sixth quadrilateral, the seventh pentagonal, the eighth quadrilateral, the ninth pentagonal, the tenth quadrilateral, the eleventh pentagonal, and the twelfth quadrilateral; these forms are constant. All the plates are smooth in the centre, and but indistinctly marked with concentric striæ near their borders.

The sternum is oblong, full, and rounded in front, deeply emarginate behind, and composed of two valves, of which the posterior is rather the larger. These valves are united to each other and to the sternum by ligamento-elastic tissue, so that both sections are moveable on the same axis. The gular plates are very regularly triangular, with their apices backwards; the brachial are elongated, quadrilateral, rounded and broader externally, straight and narrower within. The thoracic and abdominal plates are regularly quadrilateral, and nearly of the same size. The femoral are similar in form to the brachial plates, and the subcaudal are rhomboidal. All these plates are marked with concentric striæ.

The anterior extremities are strong, rounded, and covered with imbricated scales in front, and with smaller scales and granulations behind; the fingers are five, palmated, and furnished each with a short curved nail. The posterior extremities are round above, flattened at the leg and tarsus, and covered in front and behind with small scales and granulations; the toes are five in number, palmated, the four internal are furnished with short curved nails. The tail is long, thick at the root, but soon becomes cylindrical and small.

Colour. The head above and at the sides is black, marked with oblong yellow spots. The upper jaw is dark, with transverse waving lines of dirty yellow, and the whole lower jaw yellow. The neck above is granulated and dusky; the chin bright yellow; the throat yellow, but more clouded, especially towards the sternum.

The entire ground of the shell is jet black, marked with numerous yellow spots,

oblong and round, sometimes arranged in concentric or radiating lines, at others disposed without order.

The sternum is dusky yellow, each plate with a large quadrangular dark spot on their outer and posterior angles; these blotches involve about one-fourth of the plate.

The anterior extremities are yellow in front, with the margin of many of the scales dusky; the posterior surface is dusky, and marked with yellow spots. The posterior extremities are dusky above, and dirty yellowish-white below. The tail is black above, with two obscure yellowish longitudinal lines, and dusky below.

Dimensions. Length of shell, 8 inches; breadth of shell, 5 inches 4 lines; length of sternum, $7\frac{1}{2}$ inches; elevation, 3 inches; length of tail, $2\frac{3}{4}$ inches.

Habits. It is known to be a land animal, and found about the meadows and prairies of the west.

Geographical Distribution. The sole locality that can at this moment be assigned to the Emys Blandingii, is the prairies in the state of Illinois and territory of Wisconsin, where they are said to be abundant. The only specimen I have seen came from Fox river, a tributary of the Illinois.

General Remarks. This animal was first observed by Dr. William Blanding, of Philadelphia, an accurate Naturalist, whose name I have given to the species. For a long time I had believed there was but one species of Cistuda in the United States, and am greatly pleased to find a second; the more so as it makes another step in the transition of forms from land to fresh-water tortoises. The Cistuda Blandingii is very fairly the representative here of the Cistuda europea of the old world, and belongs to that section of the genus Cistuda that Dumeril and Bibron have called "Hiantes," as it cannot close the shell as perfectly as the "Clausiles," which section includes the Cistuda carolina.

Dr. Blanding says the animal from which this description was taken was a female, and had, when examined, sixty eggs in different stages of developement. He furthermore observes that he was struck at first view with the difference of form of this animal and the common Cistuda, and on further examination he found it could never bring the sternum in contact with the shell so as to conceal the head, neck, extremities and tail, as can the Cistuda carolina.

There can then be no doubt of its being a new species of Cistuda, for

1. The head resembles that of an Emys, and has the upper jaw deeply emarginate in front; while in the hundreds of the common box tortoise that I have examined, all had a broad flattened hook in front, although not recurved.

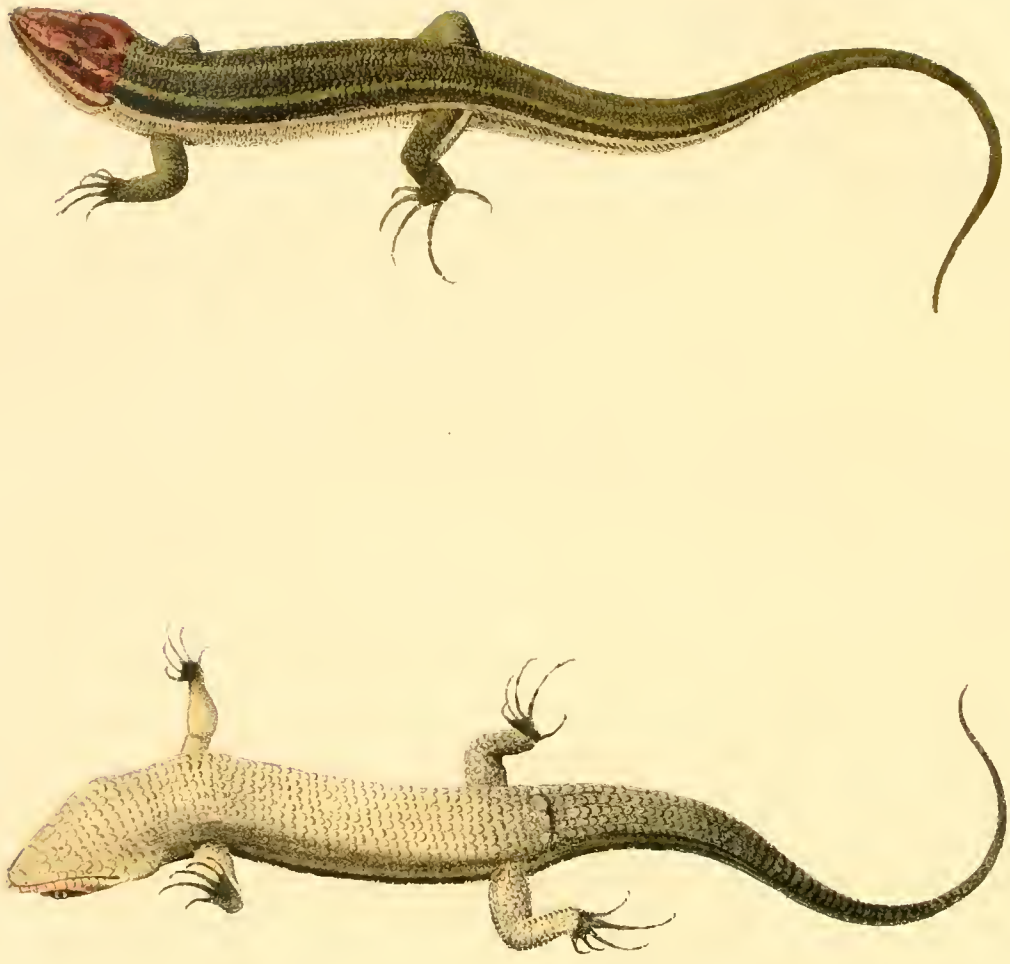
2. The form of the cărapace is that of an Emys, the anterior margin, or that corresponding to the anterior section of the sternum, but slightly elevated; while in the Cistuda carolina the same margin rises at an angle of 45° or nearly.

3. It differs in the form of its sternum, deeply emarginate behind, which I have never seen in the Cistuda carolina.

4. In the proportionate size of the two sections of the sternum, thus the posterior is to the anterior as 43.39, while in the Cistuda carolina it is as 31.22.

5. In its inability to bring the sternum completely in contact with the shell.

N. B. This animal was received after the description of the Cistuda carolina was printed.



Scincus quinquelineatus.

Sera pinxt.

P.S. Duval Lithr Philad.a

SCINCUS QUINQUELINEATUS.—*Linnæus.*

Plate VI.

Characters. Head pale red, with six obscure white lines, the two internal confluent at the occiput; body dusky above, tinged with green, marked with five pale white longitudinal lines; tail brown.

Synonymes. Lacerta quinquelineata, *Lin.*, Syst. Nat., vol. i. p. 366.
Lacerta quinquelineata, *Latr.*, Hist. Nat. Rept., tom. i. p. 248.
Scincus quinquelineatus, *Daud.*, Hist. Nat. des Rept., tom. iv. p. 272.
Scincus tristatus, *Daud.*, MSS. from Bosc, Hist. Nat. des Rept., tom. iv. p. 296.
Scincus quinquelineatus, *Schneid.*, Hist. Amph., fas. ii. p. 201.
Lacerta quinquelineata, *Shaw*, Gen. Zool., vol. iii. p. 241.
Lacerta tristata, *Bosc*, Nouv. Dict. d'Hist. Nat., tom. xvii. p. 524, pl. xv. fig. 2.
Scincus quinquelineatus, *Merr.*, Versuch eines Syst. der Rept., p. 71.
Euprepis quinquelineatus, *Wäg.*, Natürlich. Syst. der Amph., p. 162.
Scincus bicolor, *Harl.*, Jour. Acad. Nat. Scien. Philad., vol. iv. p. 286, pl. xviii. fig. 1.
Scincus quinquelineatus, *Harl.*, Med. and Phys. Res., p. 138.

Description. The head is large, somewhat triangular, broad behind, though much less so than the Scincus erythrocephalus, with the snout elongated, narrow and rounded. The vertical plate is elongated, hexagonal, broad in front, narrow behind; there are five occipital plates, arranged in two rows; the anterior row has two plates, pentagonal, and broadest internally; the posterior row has three, the middle one of which is greatly elongated, pentagonal, larger and angled in front—the lateral are larger and nearly quadrilateral, with their anterior and internal angles truncate, which gives them a slight pentagonal appearance; behind these are several large scales. There are four large quadrilateral superior orbital

plates and three posterior orbitals, the lower one larger, besides some small scales interposed between them and the eyelids, which are also covered with minute scales; there are four anterior orbital plates, one of which is large, and the superior makes a part of the superciliary ridge; the inferior wall of the orbit is completed by the fifth and sixth superior labial plates. The frontal are pentagonal, a little rounded, and broadest transversely; the centro-frontal is broad and hexagonal, and the anterior frontals are small, round and oblong. The rostral plate is triangular, with its apex upwards, and its basis rounded and directed downwards. The nasal plates are single on each side, small, and nearly circular in shape. The margin of the upper jaw is covered with eight quadrilateral labial plates, the posterior of which is largest above, and behind these are temporal scales. The nostrils are near the snout, lateral, but open upwards and outwards. The eyes are small, the pupil dark and the iris gray. The opening of the external ear is large and oval, longest vertically.

The body is elongated, cylindrical, and covered with subhexagonal scales, so rounded and imbricated as to appear semicircular; these scales are arranged in longitudinal and oblique rows. The throat and abdomen are covered with rhomboidal scales, imbricated and rounded posteriorly like those of the back. The vent is transverse, with two large and two small scales in front, and small scales behind.

The anterior extremities are short and covered with scales, similar to those on the back, and terminate in five distinct slender fingers, covered with scales, and each furnished with a small, delicate, curved nail. The posterior extremities are large, and covered with scales like the anterior, and terminate in five long slender toes, each with a short and curved nail.

The tail is cylindrical and very long, and covered above with hexagonal scales, a little rounded posteriorly; below it is covered with five rows of similar scales, and all of the same size, for one-third its length, when their place is supplied by a single row of larger plates, like the subcaudal plates of the boa.

Colour. The head is pale red above to the tip of the snout, and marked with six obscure white lines, two are above each eye and one below. These lines are only remarkable in the young animal; in the very old they become nearly obsolete.

The body is dusky, with a tinge of green, and marked with five light coloured lines, more or less distinct; the vertebral line is very dingy white, frequently not evident; it is formed by the junction of the two superior lines of the head, extends to about one-third of the tail, and includes about one-third of two adjoining scales. On each side of this is another line more distinct, continuous with that above the orbit, and extended to nearly the same distance; this line either takes up a whole scale, or it runs through its centre. Below the latter is still another line continuous with that beneath the orbit, and is most distinct of all; it is interrupted at the external meatus, but again recommences behind it, and is extended above the shoulder, along the flanks, and terminates on the tail; this also includes one scale, or it passes longitudinally through its centre. Between these two latter lines is a broad dark coloured lateral band.

The throat and abdomen are white.

The tail is coloured like the body above, but the lines are less distinct, and terminate about half its length, when the whole becomes dusky, with a tinge of blue.

The anterior and posterior extremities are of the same colour as the back above, and are silvery white below, with a short white line on the posterior face of the thigh.

Dimensions. Length of head, 7½ lines; length of body from head to vent, 2 inches 3 lines; length of tail beyond the vent, 4 inches 4 lines; length of thigh, 4 lines; of leg, 4 lines; of tarsus and toes, 6 lines; total length, 7 inches 2 lines.

Habits. The Scincus quinquelineatus lives on insects, and is found in our forests, choosing for its residence holes in the stumps of old and decaying trees, or such as have fallen to the earth. Although it climbs readily enough, it is almost always found on the ground, and I have never yet seen its abode at any great elevation.

Geographical Distribution. The Scincus quinquelineatus is found in the Atlantic states, according to Dr. Pickering, from lat. 35° to the Gulf of Mexico; its western range cannot now be determined, but it is certainly extensive, as Say observed it at Engineer cantonment, on the Missouri river; Dr. Pickering saw it in Ohio; and I have received specimens from Mississippi and Louisiana.

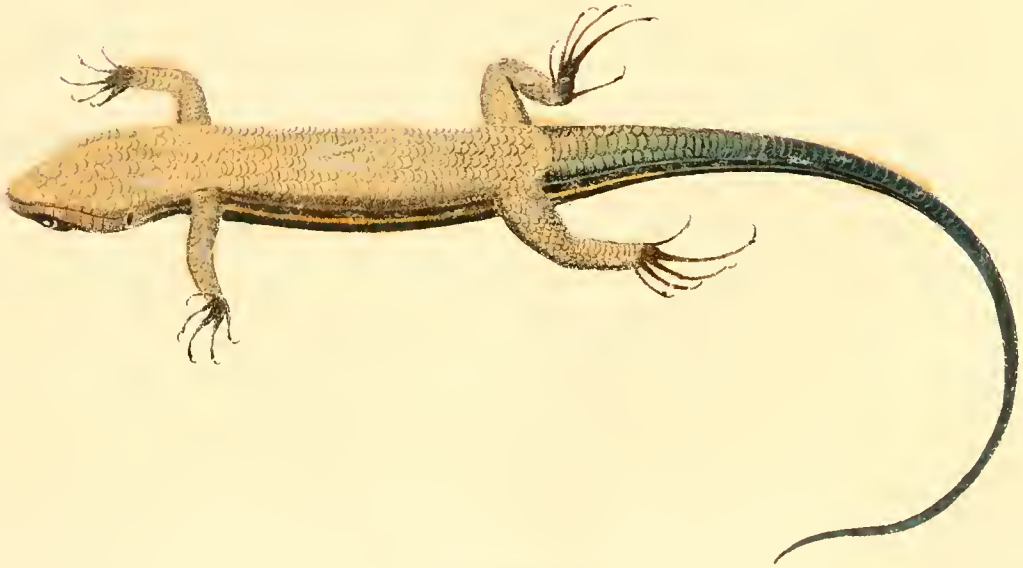
General Remarks. Linnæus gave the first account of this animal in the twelfth edition of the Systema Naturæ, from an individual sent him by Dr. Garden, of Charleston. The description is on the whole good, but was evidently taken from a specimen preserved in alcohol, which had changed the red colour of the head, as no mention is made of it.

Latreille and Daudin, though they describe this animal under the specific name of "quinquelineatus," again reproduce it under that of "tristatus;" the former arranging it among the lizards, the latter more properly with the skinks; both, however, describe it from specimens sent them by Bose. That these specimens were preserved in alcohol, is evident, as no notice is taken of the red head; and that they were adult animals, is equally certain, as no mention is made of the lines about the head, or of the vertebral line, which all become nearly obsolete in old age. The Scincus tristatus of Daudin cannot be meant for the Scincus fasciatus, for in that the six lines about the head always exist; nor for the Scincus erythrocephalus, as his description of the plates under the tail might lead one to suppose, for in the latter animal the head is always red, and the longitudinal lines along the body are always wanting.

There can be little doubt that Garden himself, who had the best opportunity of

examining, believed this animal to be different from the Blue tailed lizard of Catesby, or he would never have sent it to Linnæus as a new species.

After all, the specific name of "quinquelineatus" is not so well chosen as it appears at first view, for others of the same genus have the same number of lines, and disposed nearly in a similar manner.



Scincus fasciatus.

SCINCUS FASCIATUS.—*Linnæus.*

Plate VII.

Characters. Head above bluish-black, marked with six straw-coloured lines, the two superior unite at the occiput; body above bluish-black, with five straw-coloured longitudinal lines; tail rich ultra-marine blue.

Synonymes. Blue tailed lizard, *Catesb*, Carolina, &c., vol. ii. p. 67, pl. lxvii.
Lacerta fasciata, *Lin.*, Syst. Nat., ed. x., vol. i. p. 209.
Lacerta fasciata, *Lin.*, Syst. Nat., ed. xii., p. 369.
Blue tailed lizard, *Penn.*, Arct. Zool., vol. ii. p. 334.
Lacerta fasciata, *Gmel.*, Syst. Nat. Lin., vol. i. p. 1075.
Scincus quinquelineatus, *Schneid.*, Hist. Amph., fas. ii. p. 202, *variety.*
Scincus quinquelineatus, *Daud.*, Hist. Nat. des Rept., tom. iv. p. 272, *variety* i. p. 275.
Lacerta fasciata, *Shaw*, Gen. Zool., vol. iii. p. 241.
Euprepis fasciatus, *Wag.*, Natür. Syst. der Amph., p. 162.
Scincus quinquelineatus, *Harl.*, Med. and Phys. Res., p. 138.
Blue tailed lizard, *Vulgo.*

Description. The head is short, broad behind, with the snout a little pointed and rounded. The vertical plate is hexagonal, broader before, narrow behind. There are five occipital plates; the two anterior are quadrilateral and smaller; and of the three posterior, the central is elongated, narrow and rhomboidal, broad and angled in front, narrow and rounded behind; back of the occipital are large scales, and on the sides temporal plates. There are four large superior orbital plates, of which the two central are largest; there are three small posterior orbital, and four larger anterior orbital plates; while the inferior wall of the orbit is completed by the fifth and sixth superior labial plates. The frontal are

irregularly quadrilateral, with their internal angles elongated; and the anterior frontal are subquadrilateral and rounded in front. The rostral plate is large, pentagonal, hollowed below and angled above. The nasal are rounded and single on each side; the internasal elongated and pentagonal. The nostrils are very near the snout, and lateral, but opening upwards and outwards. There are eight quadrilateral superior labial plates, larger posteriorly. The eyes are rather small, the pupil dark, the iris golden, the eyelids dark brown, with an internal narrow yellow margin. The external meatus of the ear is oval, vertical and large, and the tympanum pale flesh-colour.

The body is elongated, cylindrical, and covered above with rhomboidal scales, imbricated, and arranged in longitudinal rows.

The throat and abdomen are covered with scales approaching the hexagonal form, but are so rounded posteriorly and so imbricated as to appear semicircular.

The tail is cylindrical, very long, and covered above with scales, larger than those on the back; below there is a central row of large plates, resembling those of the boa. These plates begin about one inch behind the vent, between which and their commencement are three rows of imbricated scales; while in the Scincus quinquelineatus there are five rows of scales, which extend to half the length of the tail. The vent is transverse, with two large and two smaller scales in front.

The anterior extremities are short, and covered with scales more nearly hexagonal, but with their external angle rounded; there are five fingers, distinct, and each furnished with a small delicate curved nail. The posterior extremities are well developed, covered with scales similar to the anterior; there are five long slender toes, each with a short curved nail.

Colour. The head and body above are beautiful bluish-black; the upper jaw is dusky, and the lower jaw bluish-white. A straw-coloured or yellowish-white

line begins near each nostril, and unite at the occiput into a longitudinal vertebral line, which becomes pale blue as it passes the posterior extremities, and finally terminates about the anterior third of the tail; this line includes the half of two contiguous scales, and has regular margins. Above and in front of the orbit of the eye begins another line of the same colour, or a little more yellow; it takes the same course, assumes the same blue colour when it has passed the posterior extremities, and terminates nearly at the same distance on the tail. Beneath this latter line is placed still another, which begins below and in front of the orbit, is interrupted at the external meatus, again recommences behind it, and is continued over the fore shoulder along the flanks to end on the tail: these two lines include the upper half of one row of scales, and have their inferior borders only straight. Between these yellowish-white lines the scales of the back are so imbricated as to give the appearance of being braided like a whip-cord.

The throat and abdomen are white.

The anterior third of the tail is coloured like the back, but lighter, and the five lines are of delicate pale blue; beyond this the colour of the tail is the richest ultra-marine blue above, a little paler below.

The anterior extremities are brownish above and silvery-white below, with a yellowish-white longitudinal line along the posterior face of the shoulder and fore arm. The posterior extremities are coloured like the anterior, and have a similar longitudinal line on their posterior surface; but this only extends the length of the thigh.

Dimensions. Length of head, 7½ lines; length of body, from head to vent, 2 inches 5 lines; length of tail beyond the vent, 5 inches; length of femur, 6 lines; of leg, 6 lines; of tarsus and toes, 9 lines; total length, 8½ inches.

Habits. The Scincus fasciatus is found in shady places, principally in forests of oak, and frequently under the bark of decaying trees. It feeds on various

species of insects, and is very lively and rapid in its motions; and as it climbs with facility, is not easily taken alive. It seldom, however, takes to the trees, unless to escape its pursuers; but, like the Scincus quinquelineatus, is almost always found on the ground, or on the trunks of fallen trees, which it chooses for its basking place.

Geographical Distribution. This animal is found in several of the Atlantic states; Dr. Haldaman has observed it in Pennsylvania; Dr. Geddings in Maryland; I have seen it in the Carolinas, and have received specimens from Georgia, the Floridas, and Alabama: nor is the Scincus fasciatus confined to the Atlantic states, for Dr. Pickering observed it in Ohio, and Say even as high as Engineer cantonment, on the Missouri.

General Remarks. It is not a little singular that this animal should have been so frequently confounded with the Scincus quinquelineatus, when they are so entirely distinct, as may readily be seen by a reference to the accompanying plates. Catesby first described the Scincus fasciatus, and gave a tolerable plate of it, under the name blue tailed lizard, in his History of Carolina, &c. Linnæus next received it in the tenth edition of his Systema Naturæ, under the name Lacerta fasciata; nor can there be any doubt of his meaning, for his first reference is to Catesby's "lacerta cauda cerulea," his second to Pettiver,* which reference must go for little, as no one can positively determine at this time what animal Pettiver had in view. The same description and the same references are continued in his twelfth and last edition; although here for the first time appears, as a new species, the Scincus quinquelineatus sent him by Garden. Gmelin also, in his edition of the Systema Naturæ, received very properly the Scincus fasciatus and Scincus quinquelineatus as different species.

Schneider appears to have been the first to consider these two animals as nearly identical; for, in describing the Scincus quinquelineatus, he says: "Forte Linnæi

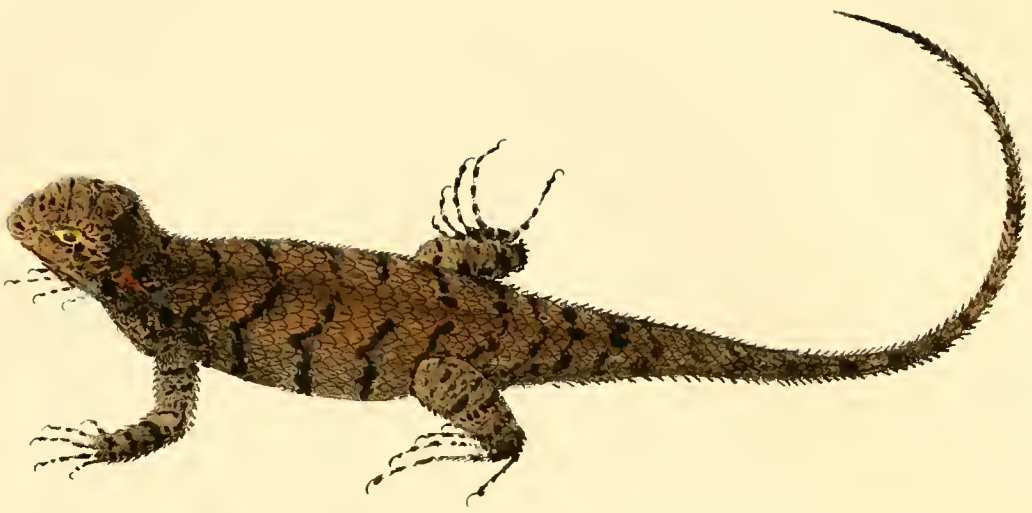
* Gaz. Nat. et Art, pl. i. fig. 1.

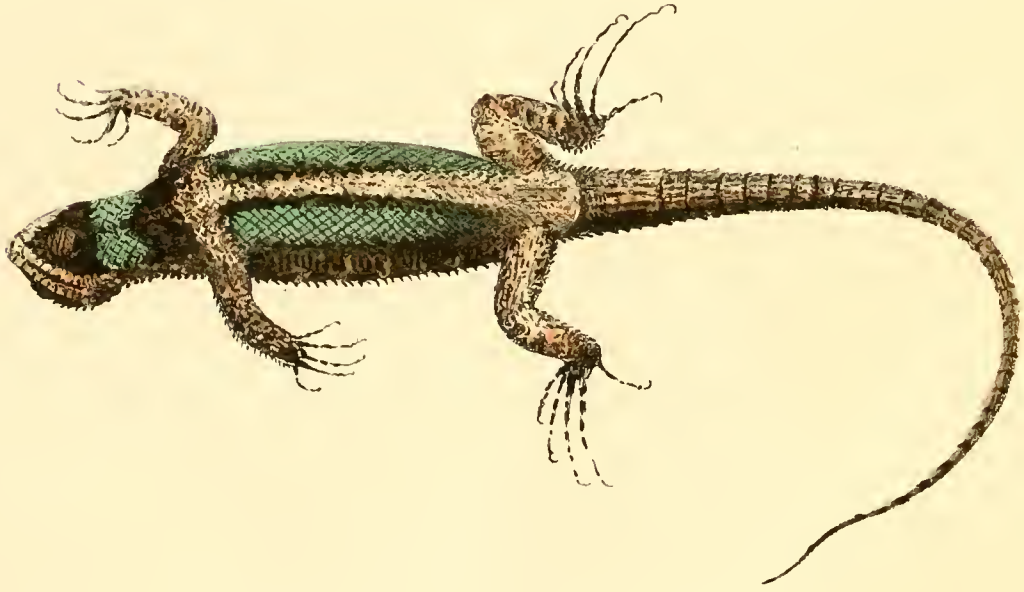
fasciata lacerta carolinensis hinc non multum abludit;" and in this he has been followed by most Naturalists, as Latreille, Daudin, &c., with the exception of Shaw.

That they are distinct animals, I believe; for

1. Their whole colour is different. In the Scincus quinquelineatus the head is always red; the body olive, tinged with green; the tail dusky; while in the Scincus fasciatus the head and body are bluish-black; the six lines about the head and five of the body are constant, and the tail always a beautiful ultra-marine blue: nor is this colour the result of injury, as some have supposed, for the colour is the more brilliant the younger the animal, as I have seen in hundreds of instances.

2. The geographical distribution of animals would, if it were properly known, go far in determining the identity of species; thus the Scincus quinquelineatus is a southern animal, and has never yet been found, as far as I know, north of Virginia, though abundant in the Carolinas, Georgia, and the more southern and western states, as Ohio and Missouri; while the Scincus fasciatus inhabits the Atlantic states from New York to Florida, but has not yet been found west of the Alleghany mountains.





Tropidolepis undulatus.

8

P.S. Duval Lith. Philadª

TROPIDOLEPIS.—*Cuvier, Dumeril.*

Genus Tropidolepis.—Characters. Head short, flattened above, rounded in front, occipital plate large; no palate teeth; neck below smooth, but with an oblique depression on each side; body large, depressed, and covered with imbricated and carinated scales; neither dorsal nor caudal crest.

TROPIDOLEPIS UNDULATUS.—*Bosc.*

Plate VIII.

Characters. Head short, triangular, rounded in front; body short, thick, depressed, covered with carinated and imbricated scales, and marked with transverse undulating black bands.

Synonymes. Stellio undulatus, *Latr.*, Hist Nat. Rept., tom. ii. p. 40, MSS. from Bosc.
Agama undulata, *Daud.*, Hist. Nat. des Rept., tom. iii. p. 384.
Uromastix undulatus, *Merr.*, Versuch eines Syst. der Rept., p. 57.
Stellio undulatus, *Bosc*, Nouv. Dict. d'Hist. Nat., tom. xxi. p. 527.
Lacerta fasciata, et hyaeinthena, *Green*, Jour. Acad. Nat. Scien. Philad., vol. i. p. 349.
Tropidolepis undulatus, *Cuvier*, Reg. An., tom. ii. p. 38.
Tropidolepis undulatus, *Gray*, in Griff. An. King., vol. ix. p. 43.
Agama undulata, *Harl.*, Med. and Phys. Res., p. 140.
Tropidolepis undulatus, *Dum.* et *Bibr.*, Hist. Nat. des Rept., tom. iv. p. 298.

Description. The head is short, triangular, rounded in front, elevated above,

and covered with rough imbricated and nearly hexagonal scales. The snout is obtuse; the rostral plate pentagonal and elongated; the nasal plates are single on each side, and nearly semicircular. The nostrils are lateral, but open upwards and backwards, and are very near the snout, on the inner margin of the superciliary ridge. There are about ten frontal plates, the central longest; of the two vertical plates, the anterior is the larger; the occipital plate is broad, rounded behind, angular in front, and surrounded by six smaller scales, arranged in two rows. There are five superior orbital plates, most extensive in the transverse direction; these have an inner margin of small scales, and an outer border, consisting of three rows of small scales, forming the margin of the superciliary ridge: the eyelids themselves are covered with minute scales. The margin of the upper jaw is covered with six or seven oblong quadrilateral plates, nearly all of the same size; above these are two or three rows of small scales. The eyes are small and black, and appear sunken, from the projection of the superciliary ridge. The external meatus of the ear is large and oval, most extensive in the vertical direction; in front, it appears serrated from the projection of the points of three or four scales. The neck is contracted and short, and has on each side in front of the anterior extremities a deep oblong depression, covered with a fold of the skin.

The body is elongated, though full, large, rounded, and covered above with small hexagonal, strongly carinated scales; each carina terminating posteriorly in a sharp, elongated point. These carinæ form sharp ridges, which are directed longitudinally on the back, but obliquely on the flanks. The abdomen is broad, flattened, rounded at the sides, and covered with rhomboidal, reticulated, and imbricated scales, each scale terminating posteriorly in a point. The scales on the throat and anterior part of the chest are frequently notched behind instead of ending in a point; those under the chin are very small. The tail is long, cylindrical, and covered with sharp, elongated or imbricated scales, pentagonal or triangular, with their apices rounded, and are verticillated or arranged in circular rows, which renders the tail rough to the touch.

The anterior extremities are short and rounded, covered above with scales

similar to those on the back; below, however, they are smooth. There are five fingers, furnished each with a delicate, short and curved nail. The posterior extremities are twice the size of the anterior, and are covered with similar scales, with a range of sixteen or eighteen pores on the inferior surface of the thigh; behind these are numerous small scales that make a sort of ridge. There are five toes, long and slender, and scaled to the root of the nails, which are short and curved.

Colour. The head is dark brown above, with a black bar extending from orbit to orbit; behind this is a dusky white bar of similar extent. The neck above is dark grey; behind the tympanum are two or three scales with their margins of bright red. The lower jaw is silvery grey; and the throat black, with a broad green blotch ascending, to be visible on the side of the neck, sometimes interrupted in the mesial line.

The body is pepper-and-salt grey above, with five or six transverse black bands, not of equal breadth in all parts, and having their posterior borders marked with white blotches, which frequently become continuous, so that their posterior margins appear tipped with a white edge. The abdomen is silvery grey, marked with small, oblong, black spots; these are so disposed near the centre as to form an interrupted line, which is most distinct between the thighs. On each side of the abdomen is a long green blotch, surrounded with black, which runs to the anterior extremities; and the lighter central portion of the abdomen meeting the lighter line extended from the inferior surface of the anterior extremities forms a cross on the thorax.

The tail is dusky, with several transverse bands of black.

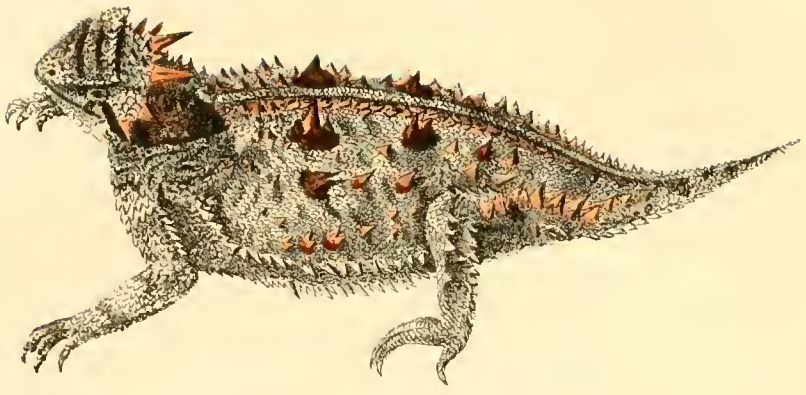
The anterior extremities are dusky above, with transverse bands of black even to the toes, with a few white spots on their anterior and posterior surface; the under surface is silver grey. The posterior extremities are coloured like the anterior, both above and below.

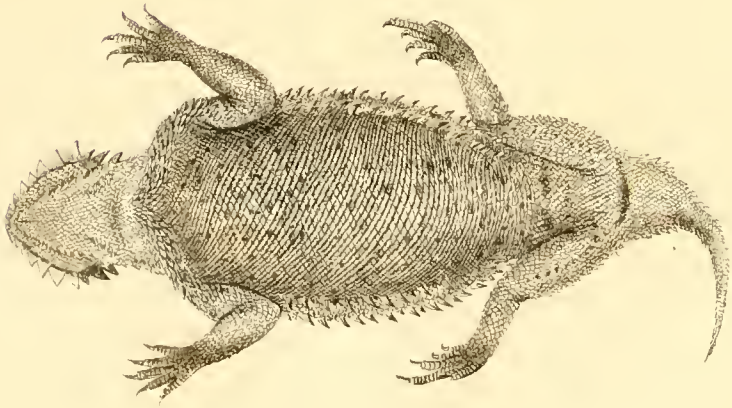
Dimensions. Length of head, 7 lines; length of body, 3 inches 3 lines; length of tail, 4 inches; total length, 7 inches 8 lines.

Habits. The Tropidolepis undulatus inhabits chiefly the pine forests of our country, and is often found under the bark of decaying trees; it chooses also commonly old fences as its basking place. It is exceedingly rapid in its motions, climbing with great facility to the tops of trees, and is hence not taken alive without great difficulty. Its food is insects, especially such as are found under decayed wood.

Geographical Distribution. The Tropidolepis undulatus has a very extended geographical range. It is abundant in the forests of New Jersey, and is found even as far north as latitude 43°, whence it reaches the Gulf of Mexico along the Atlantic states; and is also common west of the Alleghany mountains, as I have seen individuals of this species from Mississippi, Louisiana and Arkansas; and Say observed it at Engineer Cantonment, on the Missouri.

General Remarks. There can be no doubt that this animal was first observed in Carolina by Bosc, who, in his manuscript notes sent to Latreille and Daudin, describes it under the name Stellio undulatus, as Latreille first published it, though Daudin afterwards arranged it as an Agama. Cuvier placed it in the genus Tropidolepis, in which he has been followed by Dumeril and Bibron, who have recently so well described the animal as to leave nothing to be required.





Phrynosoma cornuta.

PHRYNOSOMA.—*Weigmann.*

Genus Phrynosoma.—Characters. Head short, rounded anteriorly, bordered laterally and posteriorly with strong spines, and covered above with polygonal nearly equal sized scales; occipital plate semicircular; palate teeth wanting.

PHRYNOSOMA CORNUTA.—*Harlan.*

Plate IX.

Characters. Head short, thick, triangular, rounded in front, with a range of long spines on each side of the lower jaw—nostrils open within the internal margin of the superciliary ridge; body short, flattened, rounded, covered with trihædral tubercles, intermixed with small imbricated scales; abdomen flattened, and covered with rhomboidal carinated scales; femoral pores, but not well developed.

Synonymes. Lacerta tapayaxin, *Bart.*, Med. and Phys. Jour., vol. iii. part ii. p. 68.
Agama cornuta, *Harl.*, Jour. Acad. Nat. Scien. Philad., vol. iv. p. 299, pl. xx.
Tapaya orbicularis, *Cuv.*, Reg. An., tom. ii. p. 37.
Phrynosoma cornuta, *Gray*, in Griff. An. King., vol. ix. p. 45.
Phrynosoma harlani, *Weig.*, Herp. Mex., pars i. p. 54.
Phrynosoma harlani, *Dum.* et *Bibr.*, Hist. Nat. des Rept., tom. iv. p. 315.
Horned toad, *Vulgo.*

Description. The head has nearly the form of an equilateral triangle, rounded at the snout, and covered on the vertex with small polygonal scales, all nearly of

the same size; the occipital plate is small and subround; the remaining parts of the occipital space is covered with small scales and small conical pointed tubercles, sometimes grooved. The rostral plate is small, pentagonal, and rounded above. The nasal plates are single on each side, circular, narrow, surrounded by five or six small polygonal scales, with the opening for the nares nearly in the middle. The nostrils are very near the snout, latero-superior, and open almost vertically within the internal margin of the superciliary ridge. The eyes are small and sunken, with the pupil black and the iris dark grey. The margin of the upper jaw is covered with about twelve small quadrilateral labial plates, all nearly of the same size; the three or four posterior being rather smaller. The upper margin of the lower jaw is covered with about as many labial plates, and of nearly the same size and form; its inferior margin presents a series of six horny points on each side, placed horizontally, and increasing in size from the anterior to the posterior, and give a serrated appearance to the inferior and lateral margin of the lower jaw. Above these points, but below the labial range of plates, are two series of small scales. At the posterior border of the occiput is a transverse row of prominent spines, nine in number, extending from near the front of one external meatus of the ear to the other; two of these spines are very long, and occupy the posterior border of the occipital region; three are placed externally to these on each side, and decrease gradually in size from above downwards; the ninth spine, which is smallest of all, is situated between the two central or longest: these spines are nearly conical, but are flattened at their bases. The external meatus of the ear is large and oval, most extensive in the vertical direction; this opening is granulated posteriorly, and is a little prominent in front, where there are three or four tubercles, with projecting points. The neck is very short, which gives the head the appearance of being attached to the shoulders, like the toad. The chin is covered below with small rhomboidal scales; besides these are two rows of larger and pointed scales running to the neck, within and parallel to the rows of spines that margin the lower jaw, but separated from them by three or four series of small scales. The skin of the neck is slightly folded transversely, but on the sides are larger folds that cover depressions; the most remarkable is placed in front of the shoulder. The borders of these folds are frequently armed with short spines.

The body is short, flattened, ecarinate, rounded at the sides, and covered with trihedral pointed tubercles, intermingled with small, rhomboidal, carinated and imbricated scales. The vertebral line is covered with about four rows of small, nearly equal sized scales, and appears flattened by reason of the absence of the carinated scales and tubercles found in other parts. On each side the vertebral line, and irregularly disposed in rows of four or five each, are seen large pointed trihedral tubercles, surrounded by others of similar form, but smaller. The flanks are arched outward, and present, from the shoulder to the thigh, two series of spines, of which the upper is larger, leaving a groove between them covered with granulations; these spines give a serrated appearance to the flanks. The thorax is covered with large rhomboidal scales, strongly carinated; the scales of the abdomen are also rhomboidal and carinated, but less distinctly, and of smaller size.

The tail is broad and flattened at its root, but soon becomes smaller and terminates in a point, and is covered above with large rhomboidal, imbricated and strongly carinated scales, with a few small spines about its basis, and below with smooth scales. The vent is transverse, and has small scales both before and behind.

The anterior extremities are large, and protected in front and above with large rhomboidal, carinated scales, each carina terminating in a spine, and below with smooth and smaller scales; the fingers are five, distinct, slender, and furnished each with a small, short and curved nail. The posterior extremities are but little longer than the anterior, and are covered in a similar manner, with the exception of having a few large trihedral spines scattered about the superior and posterior part of the thigh and leg; there are five toes, distinct, long, slender, each with a short and curved nail. There are six or eight pores on the inferior surface of the thigh, but not well developed.

Colour. The head above is ash coloured, with a dark bar across the vertex; the forehead is dusky, and the margin of the upper jaw pepper-and-salt grey. The border between the spines, in which the superciliary ridges terminate posteriorly,

is margined with black; from the inferior and anterior part of the orbit descends, perpendicularly, a narrow dusky bar; another bar of the same colour, but broader, runs from the inferior and posterior margin of the orbit downwards and backwards to the root of the two anterior and inferior spines of the range surrounding the occiput. These two spines are dirty white, the inferior one margined below with dusky; the two central occipital spines are dark chestnut at their bases, and black at their apices. The chin and throat are silvery white.

The ground of the colour of the neck and body above is ash, with a line of yellowish-white along the vertebral column, reaching from the head nearly to the extremity of the tail; on each side of this line at the neck is an oblong dark blotch, which extends to the anterior extremities, larger before and smaller behind. The body above is marked with three transverse dark coloured blotches or bands, not however crossing the vertebral line; the anterior is only a dark oblong spot, in the centre of which is a long spine; the basis of this, as well as of most of the spines, is surrounded with an irregular circular border of chestnut, with an occasional tinge of yellow; the spines themselves are a darker chestnut; the central and posterior bars are most extensive, but even they only reach the margin of the vertebral line. The thorax and abdomen are silvery white, with small dusky spots, sometimes round, sometimes oval, each including a portion of three or four scales. The tail is coloured above like the back, and is completely banded towards the tip—below it is silver-gray. The anterior and posterior extremities are ash colour above, marked with transverse dusky bars, and silver-grey beneath.

Dimensions. Length of head to root of occipital spines, 7 lines; length of body, from head to vent, $2\frac{1}{4}$ inches; of tail, beyond the vent, $1\frac{3}{4}$ inches; of thigh, 9 lines; of leg, 9 lines; of tarsus and toes, 9 lines; total length, 4 inches 7 lines.

Habits. The Phrynosoma cornuta inhabits the prairies of the west; it moves, according to the accounts of those who have seen them in the wild state, with great rapidity from place to place, either in search of its prey or to escape its enemies, but never climbs. In confinement, however, its movements are sluggish;

it remains for hours in the same posture, without making any attempt to escape. The individual from which the accompanying plate was taken, was brought by Mr. Gregg from the neighbourhood of Santa Fe, near the confines of the United States, and remained in possession of Dr. T. M'Euen, of Philadelphia, for several months. It was perfectly quiet and gentle, never attempting to bite, or even to resist, when taken in the hand, and far from having the activity attributed to it in its native condition; it was not easy to make it shift its position, even by touching it; nor would it seek shelter from rain, or from the intense heat of the sun, though the temperature in the shade was above 90°. Dr. M'Euen further informed me, that it would feed on a small species of red ant, taking them slowly and at long intervals; but he could never entice it to eat other insects, though many different kinds were offered it.

Geographical Distribution. The Phrynosoma cornuta is found in the western country from the Missouri to Texas, and is very abundant about the sources of the Red river.

General Remarks. A good deal of difficulty has hitherto existed as to the history of the Phrynosoma cornuta. The first animal of this species ever seen by our Naturalists was brought alive by Lewis and Clark, and given to Mr. Jefferson, who deposited it in the Museum of the Philosophical Society of Philadelphia, where it is still kept in perfect preservation; this I have more than once examined, through the kindness of my esteemed friend, John Vaughan, Esq., librarian to that institution.

Dr. B. S. Barton was, however, the first Naturalist who published any notice of the Phrynosoma cornuta,* and proposed calling it Lacerta tapayaxin—a name that cannot be received, as it is applied to the orbicular lizard of Hernandez.

Harlan next described this animal as a new species of Agama, under the specific name cornuta, which must be retained. His description was taken after comparing

* Med. and Phys. Jour., vol. iii. part ii. p. 68.

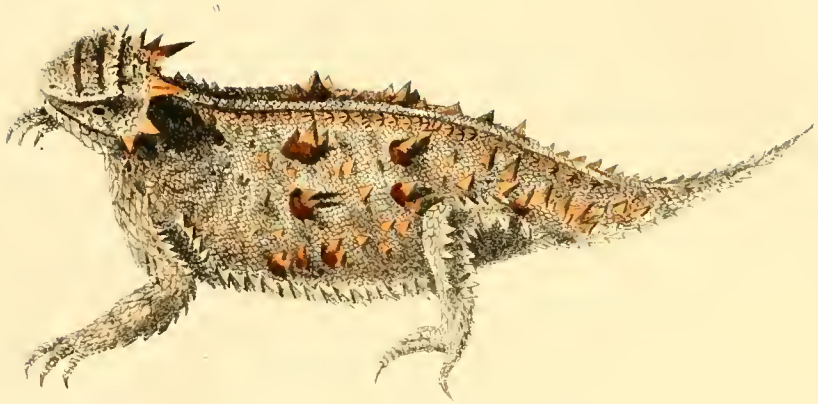
three specimens in Peale's Museum, also brought from Missouri, all of which I have ascertained, from frequent examination, to be perfectly similar: they all have carinated scales on the abdomen, and all have the nostrils opening within the superciliary ridge.

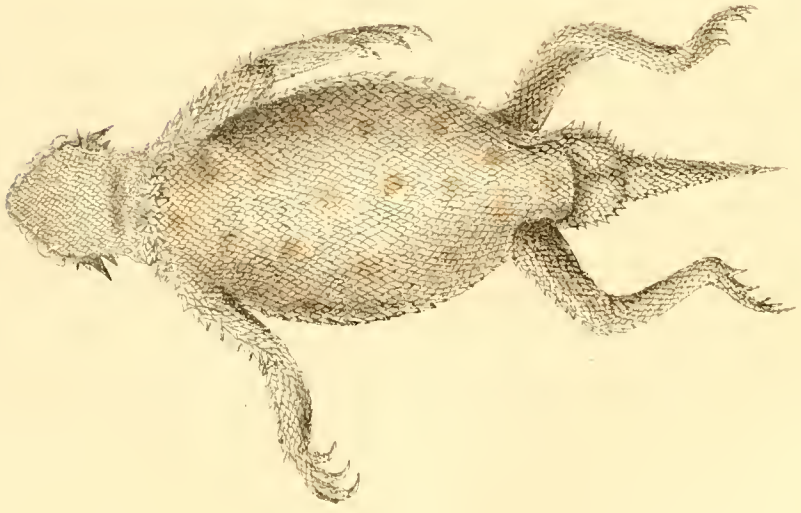
Weigmann is greatly to blame for changing the specific name of cornuta first given to this animal by Dr. Harlan, for that of Harlani; especially as he was aware, as may be seen by his reference, that the animal had previously been described as the Agama cornuta. If it were meant for a compliment to our Herpetologist, however well he may deserve it, it is badly timed, and is paid at the expense of science; it is taking away a name well applied and significant, and replacing it by another that cannot be continued, but must in the end give way to that first given.

"The discoverers of species have the undoubted right of imposing the names, (specific,) and these ought never to be altered. They may have a harsh sound, be barbarous, or even absurd, yet all these objections are as nothing, when compared with the evils accompanying the multiplication of synonymes. Even without any good reason, many Naturalists have presumed to change the names which the discoverer of the species imposed upon them, in order to obtain what appeared to them uniformity of nomenclature, or rather for the purpose of increasing their own importance. The period is probably not very remote, when this mischievous spirit of innovation shall receive an effectual check, in consequence of credit being attached only to those who develope new *characters*, and not to those who disturb science by the fabrication of unnecessary names."*

Dumeril and Bibron are still more to blame for having adopted Weigmann's name instead of that given by Harlan—a systematic work like their's ought to be free from such unpardonable errors.

* Fleming, Phil. Zool., vol. ii. p. 152.





Phymosoma orbiculare.

PHRYNOSOMA ORBICULARE.—*Hernandez.*

Plate X.

Characters. Head short, triangular, snout rounded, lower jaw without spines; the three posterior labial plates large and elevated; nostrils open at the anterior extremity of the superciliary ridge; a pointed tubercle in front of the meatus of the ear; abdomen covered with smooth scales; femoral pores fifteen, very distinct.

Synonymes. Lacerta orbicularis, *Hern.*, Nov. Plant. An. Mex., p. 67.
Phrynosoma orbiculare, *Weig.*, Isis, 1828, p. 67.
Phrynosoma orbiculare, *Wag.*, Natürl. Syst. der Amph., p. 146.
Phrynosoma orbiculare, *Weig.*, Herp. Mex., pars i. p. 53, tab. viii. fig. i.

Description. The head is short, triangular, the snout rounded, but less so than in the last species, and covered in front and on the vertex with small polygonal plates, and a few small tubercles on the occipital space. The rostral plate is very small, subpentagonal; the nasal plates are single, circular, very narrow, and surrounded by five or six polygonal scales. The nostrils are near the snout, and open at the anterior extremity of the superciliary ridge. The eyes are small and sunken; the pupil black, the iris dark grey. There are about ten small, quadrilateral, very narrow superior labial plates, which do not extend as far as the angle of the mouth, where their place is supplied by small granulations; the inferior labial plates are similar to the superior in size and number, except the three or four posterior, which are larger, and behind them is placed a conical pointed tubercle at the anterior and inferior margin of the meatus of the ear. The inferior and lateral border of the lower jaw presents a horizontal range of eight large quadrilateral plates, instead of spines, as in the cornuta; these increase in

size towards the angle of the mouth, and being slightly elevated in their centre, give a festooned appearance to the inferior and outer margin of the lower jaw; above these large plates, and below the labial plates, are two or three series of small scales. The whole chin and throat are covered with nearly equal sized, smooth, rhomboidal scales.

At the posterior border of the occiput is a row of spines, nine in number, extending from the front of one meatus of the ear to the other; the two longest of these spines are placed at the superior and posterior part of the occipital region, and have a very small one between them; three other spines are placed on the sides of the head, and decrease in size from above downwards: these spines are formed like those of the Agama cornuta. The external meatus is large, rather triangular, broader above, narrower below, with a small conical pointed tubercle at its anterior and inferior margin. The neck is short, and contracted behind the head. The chin is covered with small, equal sized, smooth, rhomboidal, imbricated scales; and the throat with similar scales, but smaller, and offers a transverse fold, which ascends on each side of the neck to cover an oblique depression in front of the anterior extremities.

The body is short, flattened, ecarinate, arched outwards at the flanks, and covered with large, pointed, trihedral tubercles, interspersed among small rhomboidal carinated scales and smaller tubercles. The vertical line is covered with three or four rows of small scales, and appears depressed, from the absence of the larger tubercles that are found in other parts. On each side of the vertebral line, and disposed in irregular rows, are scattered larger and pointed tubercles. The flanks are bordered with a row of spines, extending from the anterior to the posterior extremity. The thorax and abdomen are covered with rhomboidal, perfectly smooth scales.

The tail is broad and flattened at its root, but suddenly becomes contracted and terminates in a point, and is covered like the abdomen, but has only a few spines at its basis and along its lateral margins.

The anterior extremities are large, and covered above and in front with large elongated, rhomboidal, pointed scales, and with smooth scales below; the fingers are five in number, slender, distinct, and each furnished with a short, curved nail. The posterior extremities are but slightly larger than the anterior, and are covered like them, both above and below, with the exception of a few large spines scattered about the upper face of the thigh and leg; there are five toes, long, slender, distinct, and each with a short curved nail.

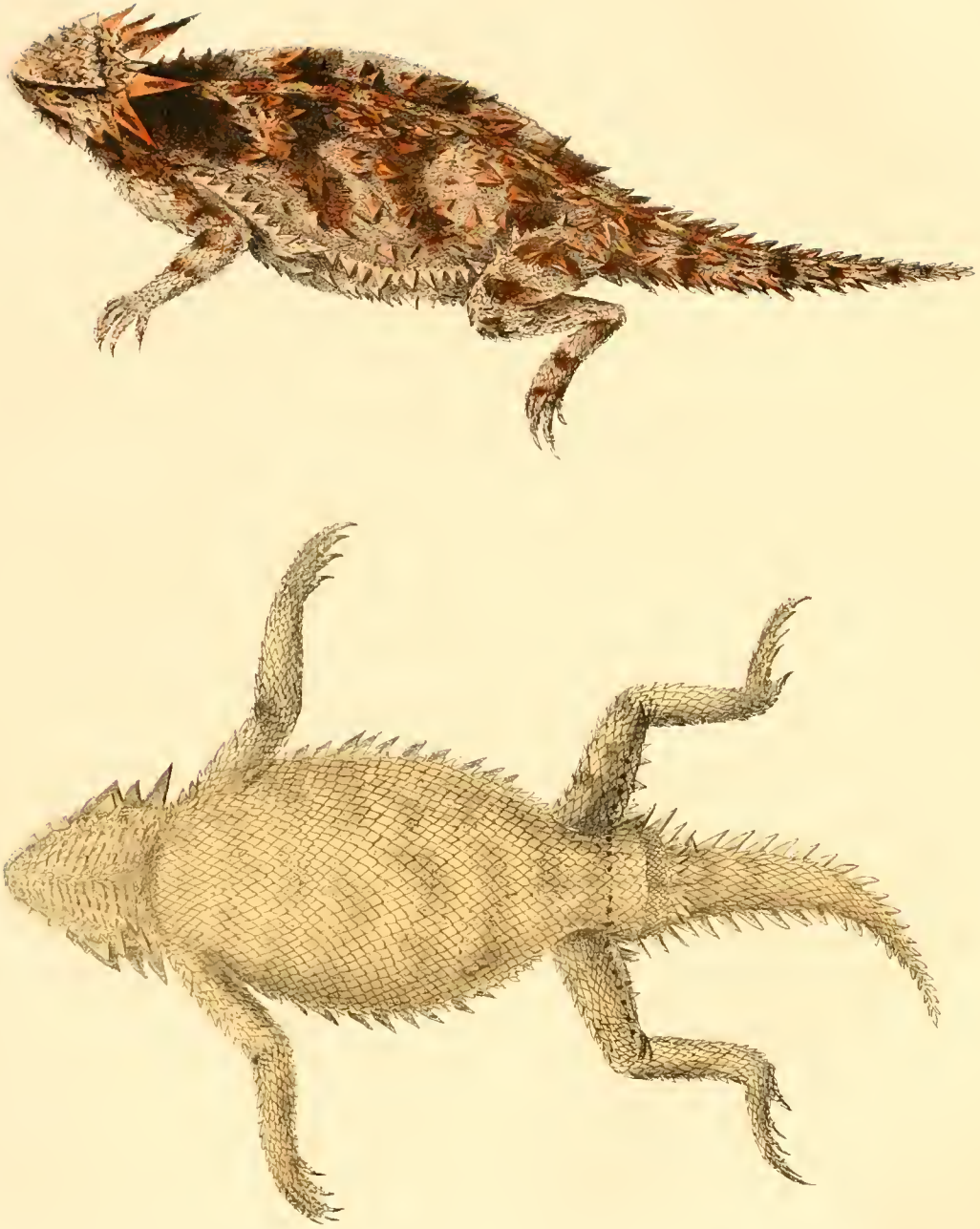
Colour. The head is dusky above, with a dark band between the orbit and another along the posterior part of the occiput. The upper jaw is grey, the lower white. The superior or long spines of the occiput are chestnut at their basis, and black at the points; the others are dusky. The chin and throat is silver white. The body, tail and extremities above are coloured precisely as in the Agama cornuta; below they are silvery-white, with oblong or round spots on the thorax and abdomen.

Dimensions. Length of head to root of spines, 7 lines; of body, from head to vent, $2\frac{1}{4}$ inches; of tail, beyond the vent, $1\frac{3}{4}$ inches; of thigh, 9 lines; of leg, 9 lines; of tarsus and toes, 9 lines; total length, 4 inches 7 lines.

Habits. I am not aware that the Phrynosoma orbiculare differs in its habits from the Phrynosoma cornuta.

Geographical Distribution. This animal is found in Arkansas and Louisiana, and extends through Texas, Mexico, &c. to the Pacific ocean.

General Remarks. There cannot be much doubt that this is the Lacerta orbicularis, or Tapayaxin, of Hernandez; for his plate, which is tolerably good, represents the scales on the thorax and abdomen as smooth.



Phrynosoma coronata.

II.

Stone by L. Auchet.

P.S. Duval, Lith. Philad.ª

PHRYNOSOMA CORONATA.—*Blainville.*

Plate XI.

Characters. Head short, triangular; nostrils open at the anterior extremity of the superciliary ridge; occipital region surrounded with eleven spines; eight rows of large rhomboidal, elongated and pointed scales under the chin, reaching to the throat, external series largest. Body covered with rhomboidal scales, and large trihedral tubercles; two rows of spines along the flanks, the superior larger; a row of spines on each side the tail, from the root to the extremity.

Synonymes. Phrynosoma coronata, *Blain.*, Nouv. Ann. du Mus. d'Hist. Nat., tom. iv. p. 284, pl. xxv. fig. 1. a b c.
Agama orbicularis, *Aud.*, Birds, &c., vol. iv. pl. ccclxviii.

Description. The head is short, thick, triangular, and covered on the forehead and vertex with small polygonal plates of unequal size, and with a few scales and elevated tubercles on the occipital region. The snout is short and rounded, with the rostral plate very small. The nostrils are near the snout, open at the anterior extremity of the superciliary ridge, and are directed upwards and a little outwards. The nasal plates are single on each side, circular, exceedingly narrow, and surrounded by six polygonal scales. The superciliary ridge is prominent, projecting over the eye, and covered with five or six quadrilateral plates; posteriorly it is elongated, and terminates in a pointed tubercle. The eyes are small and sunken, with the pupil black and the iris very dark grey. The superior labial plates are eight in number, quadrilateral, very small, and not extending to the angle of the mouth, where their place is supplied by small granulations; there are twelve inferior labial plates, quadrilateral, and still smaller

than the superior. The outer and inferor margin of the lower jaw presents a horizontal series of large tubercles, increasing in size from the chin towards the angle of the mouth; the posterior of these is a little removed from the row, and is much larger, sharply pointed, and placed directly under the angle of the mouth; the other tubercles are not elongated and spinous posteriorly, as in the Phrynosoma cornuta, but give only a festooned appearance to the lower jaw. Between these tubercles and the inferior labial plates are three or four rows of small scales. The chin is covered below on the mesial line with one or two rows of small rhomboidal scales; on each side of these are placed four rows of larger scales, greatly elongated, and pointed outwardly and posteriorly, reaching to the throat, and increasing in size from within outwards, the external largest. Beyond these, and within the series of large tubercles that border the lower jaw, are again three or four rows of small scales.

The whole posterior border of the head, from one angle of the mouth to the other, is surrounded by a row of long pointed spines, of conical shape, flattened at their bases, and disposed as in the Phrynosoma cornuta, but longer, and more numerous—in general eleven, but I have seen thirteen, the inferior very small. The external meatus of the ear is large, oval, and vertical. The neck is short, contracted behind the head, and protected above by small scales and pointed tubercles. The throat is covered with smooth rhomboidal scales, pointed posteriorly; a transverse fold of the skin ascends on the side of the throat, and covers a depression in front of the anterior extremities, where the borders of the fold is furnished with spines.

The body is short, flattened, rounded, and arched outwards at the flanks; above it is protected by small, irregular scales, intermingled with large trihedral pointed tubercles. These pointed tubercles are surrounded at their bases by others of the same form, but smaller, and are irregularly disposed in four rows on each side of the mesial line, as in the Phrynosoma cornuta, from which, however, it differs entirely in wanting the three or four rows of small scales on the vertebral line, in place of which it has large scales and spiny tubercles. The flanks are furnished with a double row of spines; the upper is much the larger, and makes a serrated

margin from the anterior to the posterior extremities. The scales on the thorax and abdomen are large, rhomboidal and smooth, terminating posteriorly in a point.

The tail is large, broad, and flattened at the root, but soon becomes smaller, is depressed in its whole length, and covered above with scales and pointed tubercles, as on the back; and below, with large rhomboidal scales, elongated in points posteriorly. On each lateral margin of the tail is a very remarkable range of large trihedral flattened spines, which gives to the tail a strong and regularly serrated border, unlike any other of this genus that I have observed.

The anterior extremities are well developed, and protected in front by large, elongated, rhomboidal scales, carinated and pointed, even to the roots of the nails; their under surface is covered with small, smooth, rhomboidal scales; there are five fingers, distinct and slender, each with a short and curved nail. The posterior extremities are but little larger than the anterior, and are covered in the same way, but have strong spines along the superior and posterior part of the thigh. The toes are five in number, large, distinct, and furnished each with a short and curved nail. On the under surface of the thigh is a range of sixteen or eighteen pores.

Colour. The head above is light brown, with a few dusky blotches; the upper jaw is grey. The three inferior spines that surround the head are light, and the two central spines are dark chestnut. The ground of the colour of the neck and body above is pepper-and-salt grey, with a lighter vertebral line from the occiput to near the extremity of the tail, but frequently interrupted by transverse dusky bars; nor is it perfect in other parts, as it contains several spines, which are all dark; on each side of this line at the neck is an oblong dark chestnut blotch, reaching to the shoulders, broad before and narrow behind. Behind these are four bands with irregular margins, which traverse completely the vertebral line, but are there less evident. The throat and abdomen are silvery-white, marked with large dusky blotches, frequently confluent. The tail is coloured like the back above, but is more completely banded, especially towards the tip; its inferior

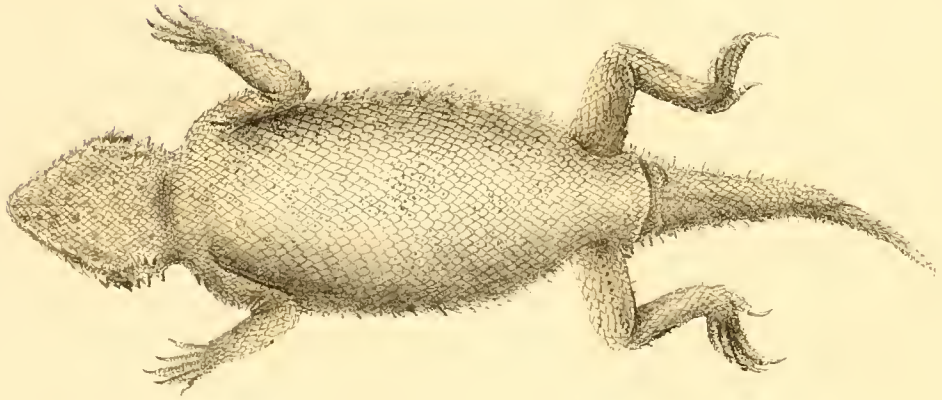
surface is silvery-grey, with a few indistinct dusky bars, corresponding with those of the upper surface. The anterior extremities are light grey above, with dusky bars and bands, and silvery-white below. The posterior extremities are coloured like the anterior, both above and below.

Dimensions. Length of head, 10 lines; of body, from head to vent, 3 inches 2 lines; of tail, 1 inch 11 lines; of thigh, 11 lines; of leg, 9 lines; of tarsus and toes, 11 lines; total length, 5 inches 11 lines.

Habits. The Phrynosoma coronata is similar in its habit, as I am informed by Mr. Nuttall, to the Phrynosoma cornuta. He says its food is invariably insects, and that he has kept them for months in confinement; that they would conceal themselves about his person or about his apartment, but make their appearance at certain times for their food, which they took readily from the hand. When in their wild state they move with great rapidity among the bushes; but when they find they cannot escape by their swiftness, they remain perfectly quiet, and suffer themselves to be made prisoners without resistance.

Geographical Distribution. The Phrynosoma coronata inhabits the country south of the Oregon river.

General Remarks. This animal was first described by Blainville, from a specimen found in California by Botta; his description is very good, but the figure accompanying it is faulty in many respects, especially in having the superciliary ridge represented with several prominent spines, and in wanting the peculiar serrated margin of the tail. Audubon next gave a good figure of it in his beautiful work on Ornithology, under the name Agama orbicularis, from a specimen furnished him by Nuttall.



Phrynosoma Douglassii.

12.

P.S. Duval Lith. Phil.ª

PHRYNOSOMA DOUGLASSII.—*Bell.*

Plate XII.

Characters. Head short, triangular, pointed and covered with tubercles, and not spines, on the posterior part, nostrils open at the anterior extremity of the superciliary ridge; body elongated, rounded, flattened, covered above with scales and slightly elevated and pointed tubercles, below with smooth scales; femoral pores, eighteen on each thigh.

Synonymes. Agama Douglassii, *Bell*, Linn. Trans., vol. xvi. p. 105, tab. x. pl. 105.
Phrynosoma Douglassii, *Wag.*, Versuch eines Natur. Syst. der Amph., p. 146.
Phrynosoma Douglassii, *Weig.*, Herp. Mex., pars i. p. 54.

Description. The head is short, triangular, flattened above, with its frontal vertical, as well as occipital regions, covered with closely imbricated polygonal scales; two slightly elevated tubercles only are seen on the latter region. The rostral plate is very small and triangular; the nasal plates are single on each side, very thin, and surrounded by five or six small scales. The nostrils are lateral, situated at the anterior extremity of the superciliary ridge, and are directed upwards and a little outwards. The superciliary ridge projects horizontally over the eye, more so than in any other Phrynosoma, and is covered with six large superior orbital plates, and terminates posteriorly in a small tubercle, very slightly pointed. The eye is small, sunken, black; the eyelids are equally moveable, and covered with minute scales. There are ten superior labial plates, quadrilateral, and all nearly of the same size; the inferior labial plates are seven in number, quadrilateral, and larger than in any of the genus. Behind these labial plates, and on the same plane, are four tubercles, slightly flattened and pointed, the posterior

largest. The inferior and external border of the lower jaw presents a series of tubercles, those in front smaller and smooth, swelling only a little in the centre, to give a festooned appearance, while those under the angle of the mouth are larger, and slightly elevated into a pointed tubercle. Between this series of tubercles and the labial plates, are interposed four or five rows of small scales. The chin is covered with small, smooth, rhomboidal scales, of equal size. There are nine small tubercles, which surround the posterior and superior part of the head, extending from the point of one meatus of the ear to the other. These tubercles are disposed as in the Phrynosoma cornuta, yet are so slightly developed as not to deserve the name of spines, for none of them exceed two lines in length, and the central tubercle is so small as hardly to be distinguished; thus the posterior part of the head loses that spiny appearance so remarkable in the Phrynosoma cornuta and Phrynosoma coronata. The entrance to the external meatus of the ear is sub-triangular, large above, smaller below.

The neck is short, contracted at the back of the head, and covered above with small scales, and small, slightly elevated pointed trihedral tubercles. The scales of the throat are smooth and very small; the skin presents a transverse fold, which terminates on the side of the neck, over a deep depression in front of the anterior extremities, and here the margins of the fold are furnished with small pointed spines.

The body is short, flattened above, rounded or arched outwards at the flanks, and is protected by small scales, interspersed with trihedral pointed tubercles, less elevated than in the three other species, and arranged in four irregular rows on each side of the vertebral line, and surrounded at their bases by smaller tubercles of similar form. The vertebral line differs here also from the P. cornuta and P. orbiculare in having several tubercles interposed in the five or six rows of scales that cover it. The flanks are furnished with only a single row of spines, that give the serrated margin. The thorax and abdomen are covered with smooth rhomboidal scales.

The tail is broad, thick and flat at its root, but soon becomes small, and terminates in a point; above it is covered with scales and small tubercles, the points of which are slightly elevated; similar points are scattered along the lateral margin of the tail, but by no means form that beautiful serrated edge seen in the Phrynosoma coronata.

The abdomen is covered with large, smooth, rhomboidal scales, elongated posteriorly. The vent is transverse, with small scales both before and behind.

The anterior extremities are large, covered above with rhomboidal carinated scales, and with a row of points along the front of the fore arm; below, the scales are smooth and small; there are five fingers, distinct, and each furnished with a short, delicate, curved nail. The posterior extremities are but slightly larger, and are covered like the anterior, with the exception of a few spines scattered about the thighs and legs. There are eighteen femoral pores, well developed.

Colour. The head is brown above, as well as the tubercles; the chin is silvery-white, with a few dusky circular spots. The superior surface of the neck and trunk is light grey, with dusky spots and bands, and with a broad vertebral band of yellowish-white; on each side of this vertebral line at the neck is an oblong dark chestnut blotch, reaching to the shoulders; the throat is silver-white. The trunk is marked with dark blotches, placed transversely, but none of them unite at the vertebral line. The thorax and abdomen are silvery-white, with minute dusky spots. The tail is coloured like the back, but is more completely banded towards the tip; the inferior surface is silvery-grey. The anterior extremities, as well as the posterior, are grey above and silvery-white below.

Dimensions. Length of head, 8 lines; of body, from head to vent, 2 inches 8 lines; of tail, beyond the vent, 1½ inches; of thigh, 7 lines; of leg, 7 lines; of tarsus and toes, 7 lines; total length, 4 inches 10 lines.

Habits. Mr. Bell* says, on the authority of Mr. David Douglas, who observed it in its wild state, that, "like most others of its tribe, it is very nimble during the summer months, and it is then difficult to capture it; but in April, when it first makes its appearance, or in October, before it retires to its winter habitation, being at both seasons weakly, it is easily taken. At such seasons the traveller is constantly annoyed by them during the night, seeking shelter from the cold under his blanket, and is frequently under the necessity of removing these little intruders on his rest. It takes up its abode in the holes made by a species of Lepus, Arctomys, (Arctomys Richardsonii,) which are alternately occupied by them and several species of Coluber, which resort there for the purpose of preying on these Agamæ, (Phrynosomæ,) and on the marmots."

He further states, on the same authority, its food to be coleopterous insects and vegetable substances, as the purschia, artemisia, &c.; but Mr. Nuttall, an accurate Naturalist, informs me that he has frequently observed these animals, during a residence of many months in the country about the Oregon river, and that their only food is insects.

Geographical Distribution. The Phrynosoma Douglassii is abundant in the sandy plains south of the river Oregon, and chooses for its residence the banks of streams that are covered with the purschia tridentata, artemisia, salvia, &c.

General Remarks. Mr. T. Bell gave the first description of this animal in the Transactions of the Linnæan Society of London, and accompanied it with a tolerable figure, in which the short knobs about the head, instead of long spines, as in the other Phrynosomæ, are well represented. The individual from which Mr. Bell took his description and figure was brought from the Oregon river by Mr. David Douglass, whose name he has given to the species.

Dumeril and Bibron† have greatly erred in supposing this to be the young of

* Trans. Linn. Soc. Lond., vol. xvi. p. 106. † Hist. Nat. des Rept., tom. iv. p. 314.

the Phrynosoma orbicularis, which they probably inferred from the size of Bell's figure. That it is an adult animal and perfectly distinct from all others of the genus, I have not the least doubt, having seen an individual, the one from which the accompanying plate was taken, brought alive to Philadelphia from the shores of the Oregon, that equalled in size any Phrynosoma cornuta or orbicularis that I have ever seen, and yet having no spines about the head.

Hylodes gryllus.

HYLODES.—*Fitzinger.*

Genus Hylodes.—Characters. Mouth furnished with a tongue, teeth in the superior maxillary and palate bones; tympanum visible; extremities slender, tips of fingers and toes terminating in slightly developed tubercles.

HYLODES GRYLLUS.—*Leconte.*

Plate XIII.

Characters. Head elongated, pointed, a triangular dusky spot between the orbits; body above cinereous, with a green, or sometimes red, vertebral line, and three oblong black spots, margined with white, on the sides. Length, $1\frac{1}{2}$ inches.

Synonymes. Savannah cricket, *Bartr.*, Trav., &c., p. 278.
Rana gryllus, *Leconte*, Ann. Lyc., Nat. Hist. N. Y., vol. i. p. 282.
Rana gryllus, *Harl.*, Med. and Phys. Res., p. 104.
Rana dorsalis, *Harl.*, Loc. Cit., p. 105.

Description. The head is elongated and rather pointed at the snout, greenish above, with a black triangular spot between the orbits of the eyes, with its apex backwards. The nostrils are lateral, and nearly midway between the orbits and the snout. The eyes are large and prominent, the pupil black; the upper half of the iris brightest golden, the lower black. The upper jaw is dusky, with a yellowish-white line from the posterior and inferior border of the orbit to the

axilla. The chin and throat are yellowish-white. The body is elongated, slender, and dusky above, with a vertebral line of bright green, or sometimes reddish-brown, which bifurcates at the occiput and runs to the superior part of the orbits of the eyes. On each side of this vertebral line are two or three large oblong spots, with white margins. The flanks are grey. The thorax and abdomen are silvery-white.

The anterior extremities are small and delicate, dusky above, with a black blotch near the elbow; beneath they are clouded white; there are four fingers, distinct, very delicate, and slightly swelling at the extremities. The posterior extremities are very long, dusky above, and barred with black; the lower surface is dirty flesh colour; there are five toes, long, and fully webbed.

Dimensions. Length, $1\frac{1}{2}$ inches; of thigh, 7 lines; of leg, 8 lines; of tarsus and toes, 1 inch 1 line.

Habits. This is a merry little frog, constantly chirping like a cricket, even in confinement; it frequents the borders of stagnant pools, and is often found on the leaves of aquatic plants, and rarely on the branches of such low shrubs as overhang or dip in the water. It feeds on various kinds of insects, and makes immense leaps to secure its prey, or to escape its pursuers. It can easily be domesticated, and takes its food readily from the hand; I have kept several for months in a glass globe on a few sprigs of purslain, (portulacca oleracea.) Their chirp, at times, was incessant, and sprinkling them with water never failed to render them more lively and noisy.

Geographical Distribution. The Hylodes gryllus is found on the Atlantic coast from latitude 43° to the Gulf of Mexico, and is very abundant in Carolina and Georgia; but as yet I have no evidence of its existence west of the Alleghany mountains.

General Remarks. The first notice of this animal is found in Bartram's

Travels in Carolina and Florida; he calls it the Savannah cricket, and gives a tolerable account of its manners. This animal forms a good connecting link between the genus rana and hyla, and seems to partake of the habits of both, for though it likes water at all times, yet it may be found on aquatic plants waiting for its prey; and it has the power of adhering to smooth surfaces like the Hyla, but less perfectly.

For the present I am disposed to arrange this animal with the Hylodes of Fitzinger, for 1. The extremities are slender, with the fingers and toes only slightly swelled at the tips; and 2. It cannot belong to the genus Rana, as it wants a bony sternum, &c.*

This animal, with the succeeding, and another not yet described, make a very good connecting link between the genera Rana and Hyla, as will be seen in the anatomical part of this work.

* See Anatomical part of this work.

Hylodes ocularis.

HYLODES OCULARIS.

Plate XIV.

Characters. Head short, snout pointed, upper jaw white, which colour is continued to the anterior extremity, above this a black band runs over the shoulder and terminates on the flanks; body short, reddish-brown; abdomen yellowish-white; length, 11 lines.

Description. The head is short and the snout pointed; the nostrils are lateral, and rather nearer the snout than the orbits. The eyes are small, but prominent, the pupil black, and the iris grey, with a tinge of red. The upper lip is white, and this colour is continued in a line to the axilla; above this is a black blotch, which begins very narrow and becomes broad under the orbit, passes over the shoulder, and there terminates. The chin and throat is yellowish-white.

The body is small and delicate, uniform reddish-brown above, and yellowish-white below. The anterior extremities are small, brown above, and clouded white below; there are four fingers, distinct, and slightly enlarged at their tips. The posterior extremities are very long, reddish-brown above, barred with dusky, and obscure white below; there are five toes, webbed, and slightly enlarged at their extremities.

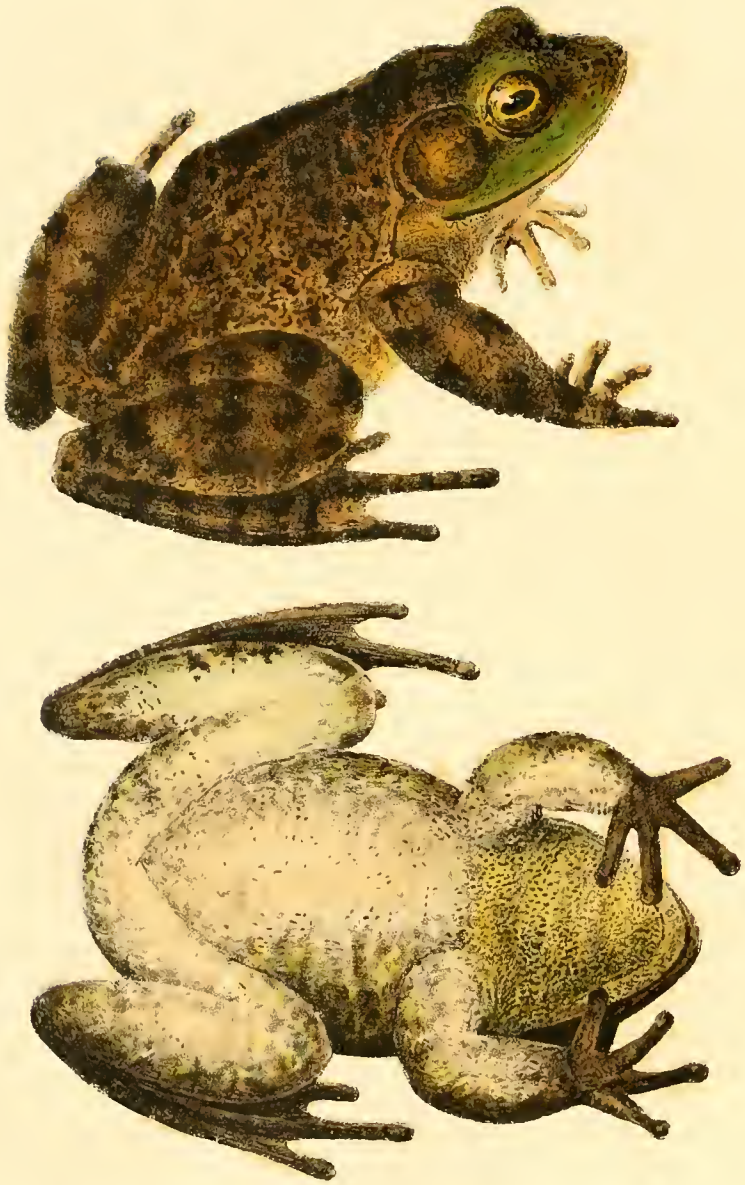
Dimensions. Length, 11 lines; thighs, $3\frac{1}{2}$ lines; leg, $3\frac{1}{2}$ lines; tarsus and toes, $6\frac{1}{2}$ lines.

Habits. This beautiful little animal, the smallest of the frog kind with which

I am acquainted, is closely allied to the Hylodes gryllus in its habits, choosing the same damp places for its abode, and is not unfrequently found on the leaves of such low shrubs as inhabit the same localities, as the myrtle (myrica cerifera); and like the Hylodes gryllus, too, it has the power of adhering to smooth surfaces, though not so perfectly as the Hylæ.

Geographical Distribution. South Carolina and Georgia can only for the present be given as the abode of the Hylodes ocularis, although doubtless it will be found to have a much wider range.

General Remarks. I have chosen the specific name ocularis for this animal, from the black spot along the eye; and this has been done the more willingly, as it is possible this animal may in the end prove to be the Hyla ocularis of Bosc and Daudin, which Leconte thinks is most probably only a variety of the Hyla squirella; and yet, as this animal is not unfrequently found on low bushes, or leaps upon them when pursued, it is not impossible that Bosc might have supposed it to be a real Hyla. Should it then turn out to be the Hyla ocularis of Bosc, an additional synonyme will be saved; but if it is an undescribed animal, which I believe, then the denomination Hylodes ocularis is well enough, as it belongs to another genus.



Rana pipiens

RANA PIPIENS.

Plate XV.

Characters. Head large, green above, yellowish-white below; body large, green in front, dusky olive behind, with irregular black blotches; abdomen yellowish-white, sometimes with dusky marks; extremities dusky, with black bars.

Synonymes. Bull frog, *Catesb.*, Carolina, &c., vol. ii. p. 72, pl. lxxii.
Bull frog, *Kalm*, Trav., &c., Forster's translation, vol. ii. p. 175.
Rana pipiens, *Latr.*, Hist. Nat. Rept., tom. ii. p. 153.
Rana catesbeana, *Shaw*, Gen. Zool., vol. iii. p. 136, pl. xxxiii.
Rana mugiens, *Merr.*, Versuch. eines Syst. der Rept., p. 175.
Rana pipiens, *Cuvier*, Reg. An., tom. ii. p. 106.
Rana pipiens, *Harl.*, Med. and Phys. Res., p. 101.
Rana scapularis, *Harl.*, Loc. Cit., p. 103.
Bull frog, *Vulgo.*

Description. The head is very large, olive above, with the snout green and rounded in front; the upper jaw is green, the lower white, with dusky marks; the throat is clouded yellow. The nostrils are lateral and nearer the snout than the orbit. The eyes are very large and prominent, the pupil black, the iris of a beautiful golden, reticulated with black. The tympanum is large, finely bronzed, with a small yellow spot in the centre. The body is large and thick, smooth above, green in front, dusky, with only a greenish tinge behind, and marked with irregular blotches of dark brown. The thorax and abdomen are smooth, yellowish-white, and often clouded with dusky.

The anterior extremities are short, thick, dusky above, with a tinge of green,

and marked with a dark brown oblong spot at the shoulder, and a similar one at the elbow; their lower surface is yellowish-white; the fingers are four in number, short, very stout, and not palmated. The posterior extremities are exceedingly long and large, dark green above, with numerous dusky brown oblong spots, or transverse bars, as far as the external toe. The under surface of the thigh is yellowish-white, the posterior part granulated; the nates are yellowish-white, mottled with black; the under surface of the leg is silvery-white; there are five long, but stout, fully palmated toes.

Dimensions. This is the largest of our frogs, reaching even to the length of 21 inches. Dimensions of the individual from which the accompanying figure was taken:—Length of body, 5 inches; of thigh, 2 inches 3 lines; of leg, 2 inches 4 lines; of tarsus and toes, 3 inches 5 lines; total, 13 inches.

Habits. Bull frogs are found about stagnant ponds or sluggish rivers, and in general, are solitary in their habits, only collecting together in the breeding season, at which time hundreds may be seen in some small pond, when the cry uttered by the males is so loud as to resemble the distant roaring of a bull, and can be heard on still evenings at the distance of half a mile. During the day they are quiet, and only begin their noise at the approach of twilight, or in dark cloudy weather. They cannot be said to abound, but are found commonly enough sitting half immersed in water, or on the banks of ponds, waiting for their prey. If alarmed, they leap suddenly into the water, like the R. fontinalis and R. halecina; but, unlike them, they do not conceal themselves at once, but frequently skim along the surface for several yards before they dive below it. They are the most aquatic of all our frogs; indeed, I have known them to live in wells for years, where they could not rest a moment on solid ground above the water, consequently they are among the best swimmers of the tribe; and for this their organization is perfect —the thighs and legs are very strong and muscular, and the broad palmated foot makes an excellent paddle. They are also exceedingly active on land, and leap to a great distance; Kalm gives an amusing story of one that beat a swift running Indian at a "foot race." They feed on various insects, and the smaller animals

that live about water, as a species of crawfish, (Astacus Blandingii,) two of which I have found at a time in the stomach of a large bull frog; and Dr. Storer informs me that he has often found their stomachs filled with snails, (Helix albolabris.) Like all other frogs, they only seize their prey when it is alive or in motion; they even take the hook readily, springing upon the bait with great avidity when it is moved gently before them.

Geographical Distribution. This animal is found in almost every part of the United States; Kalm even met with it as far north as Quebec, in latitude 47°. I have seen it in all the Atlantic, and have received specimens from the more southern states; and there is no doubt of its being in the great valley of the west, as Say observed it in Ohio.

General Remarks. In no one of our frogs is there more difficulty in ascertaining its original specific name. Clayton, in the Philosophical Transactions* for 1694, simply mentions it as a large frog, "bigger than any in England, which makes a noise something like the bellowing of a bull." Catesby, whose description is very correct, calls it the bull frog, under which name it is now universally known, and says, "the noise they make has caused their name, for at a few yards distance their bellowing sounds very much like that of a bull a quarter of a mile off." Kalm, though he calls it by the same name, began the confusion by referring it to the Rana ocellata, of Linnæus, from which it is entirely distinct; for this Rana ocellata first appears in the tenth edition of the Systema Naturæ, and is easily identified, as Linnæus gives but a single reference, Brown's History of Jamaica; and in his description he says, "plantæ pentadactylæ subpalmatæ," which certainly cannot apply to the Bull frog. Kalm, however, insisting on the identity of the Rana ocellata and Bull frog, perhaps led Linnæus, in the twelfth edition of the Systema Naturæ, to give two other references for the former animal, the Rana halecina of Kalm, and the Rana maxima, &c., of Catesby, and never were three frogs more distinct. Gmelin, in his edition of the Systema Naturæ, copies

* Vol. xviii. p. 125.

the errors of Linnæus, and adds another reference to Seba, whose animal is not even the real ocellata, which is found on the seventy-fifth, and not on the seventy-sixth table, as he supposes.

The specific name, pipiens, was not applied by Linnæus to any frog, but was first used by Gmelin, so far as I know, and given to a very different animal, the Water frog of Catesby, the common Shad frog, which had previously been called Rana halecina; and this leaves the name pipiens unapplied, at least so far as Gmelin is concerned.

It is next used by Schneider in his Historia Amphibiorum; his whole description, however, refers to the halecina of Kalm, or the Water frog of Catesby.

Latreille is the first who used the specific name pipiens without synonymes, or reference to any author, stating only that his animal was called, in Carolina, the Bull frog; his description is correct, and applicable to the Bull frog in every particular but one: he speaks of a light coloured vertebral line, which I have never seen in any individual of this species.

Latreille separates it from the Rana ocellata, which he describes as a distinct animal, and says, furthermore, that his Rana pipiens must not be mistaken for that of Schneider (Gmelin), which we have seen is the Rana halecina of Kalm; consequently then to Latreille is due the merit of first definitely applying the specific name pipiens to our Bull frog. It is singular that Daudin should not have followed his example, but far from it; he, under his Rana pipiens, gives three animals entirely distinct from each other, and his plate makes a fourth, for it represents an Indian animal, and not the American Bull frog.

N. B. Though Gmelin quotes Schneider, he does not quote the name he gives the animal.

Rana fontinalis.

16.

Sera pinx.

P. Duval Lith. Pl

RANA FONTINALIS.—*Leconte.*

Plate XVI.

Characters. Body above green, with dusky spots behind; throat and abdomen yellow; posterior extremities dark green, with transverse dusky bars; a cuticular fold, elevated into a ridge, from the orbit to the posterior extremities.

Synonymes. Rana fontinalis, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. i. p. 282.
Rana flavaviridis, *Harl.*, Med. and Phys. Res., p. 103.

Description. The head is short, but rather pointed; the nostrils are lateral, and nearly midway between the eyes and the snout. The eyes are very large and prominent; the pupil is dark, with a golden iris, beautifully reticulated with black, and having an inner circle of bright yellow. The tympanum is very large, bronzed, with a lighter spot near its centre. The head above is bright green; the upper jaw is green, the lower yellowish-white, with a few dusky marks. The throat is bright yellow. The body is elongated, but full and large, with a cuticular fold elevated into a ridge on each side, extending from the orbit to near the thighs. The anterior half of the body is light green; the posterior very dark green, sometimes with a tinge of olive, and is always marked with dusky spots, varying in size and disposition. The animal is sometimes seen more dusky than the one figured in this work, but only in cold weather—the colours I have observed most brilliant when the weather is hottest. The inferior part of the flanks is yellowish-white, mottled with black spots. The anterior half of the abdomen is bright yellow; the posterior half yellowish-white.

The anterior extremities are pale green above, yellowish-white below, with

irregular dark blotches on the posterior part of the arm and fore arm; there are four fingers, moderately long and not palmate, yellowish before and dusky behind. The posterior extremities are very long, dark green above, with dusky transverse bars or blotches; the inferior surface of the thigh is yellow, with its posterior half granulated; the nates are mottled yellow and black; the inferior surface of the leg is pale flesh colour, with a few minute black spots; there are five very long and fully palmated toes, which, as well as the webs, are lighter above and dusky below.

Dimensions. Length from snout to vent, $3\frac{1}{2}$ inches; length of head, $10\frac{1}{2}$ lines; length of thigh, 1 inch 4 lines; length of leg, 1 inch 4 lines; length of tarsus and toes, 2 inches 5 lines; total length, from the snout to the tip of the toes, 8 inches 7 lines.

Habits. The Rana fontinalis inhabits springs of cold water or the neighbourhood of running streams; it passes much of its time on land, but leaps into the water when disturbed. Its food is small worms, or such insects as may come within its reach—these it never seizes unless they are in motion.

Geographical Distribution. The Rana fontinalis is common from Maine to Virginia, but I am not aware of its existence in the more southern or in the western states.

General Remarks. Leconte first pointed out the characters of this animal in his "Remarks on the genus Hyla and Rana." Although he gave no description, still the characters he assigns are sufficient easily to distinguish it; therefore his name, which is a very good one, as giving the habits of the animal, must be continued.

Harlan next calls this animal Rana flavaviridis—a name that cannot be retained, as Leconte's has the right of priority.

It is probable that this animal may prove to be the Rana viriscens of Kalm, quoted by Gmelin and other Naturalists; although it cannot now be positively affirmed, as I have hitherto been unable to find any animal described by Kalm bearing this name, either in his travels or in those works where many of his observations were published, as the Swedish Transactions, &c.; so the specific name given this animal by Leconte must, for the present, be used.

Rana clamitans.

P.S. Duval lithe Lemoi.

RANA CLAMITANS.—*Bosc.*

Plate XVII.

Characters. Head elongated, snout rather pointed, upper jaw green; body slender, olive colour in front, very dusky behind; throat and abdomen silvery-white. Length, 3 inches.

Synonymes. Rana clamitans, *Lat.*, Hist. Nat. des Rept., tom. ii. p. 157.
Rana clamata, *Daud.*, Hist. Nat. des Rain., p. 54, pl. xvi. fig. 2.
Rana clamata, *Daud.*, Hist. Nat. des Rept., tom. viii. p. 104.
Rana clamitans, *Bosc*, Nouv. Dict. d'Hist. Nat., tom. xiii. p. 476.
Rana clamitans, *Cuvier*, Reg. An., tom. ii. p. 106.
Rana clamata, *Harlan*, Med. and Phys. Res., p. 101.

Description. The head is elongated, and bronzed above; the snout is pointed. The upper jaw is bright green, which colour is continued under the eye and tympanum to the shoulder. The lower jaw is white, marked with dusky spots or bars; these form an indistinct band that is lost about the anterior extremity. The nostrils are lateral, and rather nearer the snout than in the Rana fontinalis. The eyes are large and prominent, the pupil is black, the iris golden, beautifully reticulated with black, and has an inner margin of bright yellow. The tympanum is very large, bronzed, with a small spot of lighter colour in its centre. The body is long, slender and delicate; olive colour or bronzed in front, and dusky, approaching to black, behind, where it is slightly granulated; a cuticular fold, elevated to form a ridge, begins behind each orbit, runs along the body, and is lost near the posterior extremities. The whole surface of the throat and abdomen is silvery-white.

The anterior extremities are olive above and delicate white below; there are four fingers distinct, not palmated; and the thumb of the male is furnished with a tubercle at certain seasons. The posterior extremities are very long, dusky above, with transverse bars or blotches of darkest brown; the inferior surface of the thighs is silvery white, the posterior half granulated; the nates are mottled black and white, the former colour predominating. The inferior surface of the legs is white; there are five toes fully palmate, the fourth very long.

Dimensions. Length of body, 3 inches 2 lines; of thighs, 1 inch 7 lines; of leg, 1 inch 8 lines; of tarsus and toes, 2 inches 2 lines; total, 8 inches 7 lines.

Habits. The Rana clamitans lives in water, or on the banks of ponds and rivers, far from which it is never seen. It is exceedingly timid, and makes enormous leaps from the banks into the water when disturbed, and utters, at the same time, a short cry. Bosc says it is the most active of all our frogs, and if once made prisoner and allowed to escape, it cannot again be easily retaken.

Geographical Distribution. The Rana clamitans is found in the low countries of Carolina and Georgia, farther north than this I have never seen it, though Dr. Harlan says it is common in Pennsylvania. This is most probably a southern species, and reaches to the Gulf of Mexico, where it represents the Rana fontinalis, which is a northern animal.

General Remarks. The Rana clamitans was first described by Bosc, from specimens taken in the neighbourhood of Charleston, in manuscript notes communicated to Latreille, who published it under the name it here bears.

Rana horticonensis.

RANA HORICONENSIS.

Plate XVIII.

Characters. Head large, snout rather pointed, upper lip light bronze, with dark bars, above this an irregular, indistinct, clouded white band under the tympanum to the shoulder; body very robust, dark olive, with irregular black spots, and a cuticular fold on each side. Length, 3½ inches.

Description. The head is large, broad, with the snout rather pointed, the whole dusky green above. The nostrils are lateral, and nearer the snout than the orbits. The eyes are very large, prominent and beautiful, with the pupil black and the iris golden, reticulated with black. The tympanum is large, bronzed, with a lighter spot in its centre. The upper lip is light bronze colour, with dusky bars; above this is an indistinct band of bluish-white, interspersed with black spots, which extends from near the snout, under the orbit and tympanum, to the shoulder. The lower jaw, chin and throat, are white. The body is very robust, dark olive, interspersed with irregular black spots, with an elevated cuticular fold on each side, of lighter colour, from the orbit to the posterior extremities; the abdomen is silvery-white.

The anterior extremities are stout, dusky above and white below; there are four fingers, distinct, thick, dusky above and below. The posterior extremities are greatly developed, dark olive above, marked with transverse black bars. The anterior part of the under surface of the thighs is smooth and silvery-white, the posterior is granulated and flesh coloured; there are five toes, long, and very fully palmated, dusky above and below.

Dimensions. Length from snout to rump, $3\frac{1}{2}$ inches; length of thigh, 1 inch 8 lines; of leg, 1 inch 8 lines; of tarsus and toes, 2 inches 2 lines.

Habits. Nothing peculiar is known of the habits of the Rana horiconensis.

Geographical Distribution. The only place where this animal has been observed is at the outlet of lake George, where I found it in 1834.

General Remarks. There can be little doubt that this is a distinct species of frog. It differs from the Rana fontinalis in colour as well as in size; in the latter respect it approaches the Bull frog, from which, on the other hand, it differs in being provided with two ridges, or cuticular folds, along the back; nor can it be the Rana melanota of Rafinesque, as it wants the "yellow streak on the sides of the head." Another reason for believing this to be an undescribed species of frog is its geographical distribution, which is just at that point where the waters run north to the St. Lawrence, instead of going south to the Hudson.

The name I have given it marks its habitat, Horicon being the ancient Indian name of the beautiful water now called Lake George.

Rana nigrita.

RANA NIGRITA.—*Leconte.*

Plate XIX.

Characters. Head elongated, snout pointed, upper lip white; body above speckled with small white granulations; back olive-brown, with a tinge of yellow, and an interrupted black vertebral line; beneath whitish, granulated; extremities ash colour above, with transverse dusky bars or oblong blotches. Length, $1\frac{1}{2}$ inches.

Synonymes. Rana nigrita, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. i. p. 282.
Rana nigrita, *Harl.*, Med. and Phys. Res., p. 105.

Description. The head is elongated, and ash colour above, with the snout rather pointed. The nostrils are lateral, and nearer the mouth than the orbits. The eyes are large and prominent, the pupil black; the iris golden above and grey below. The upper jaw is yellowish-white, which colour is continued below the anterior extremities; above this is an irregular black blotch, beginning near the snout, including the greater part of the eye, and reaching to the shoulder. The body is slender, olive-brown, and a tinge of yellow, and an interrupted black vertebral line from the snout to the rump; the abdomen is yellowish-white, and granulated posteriorly.

The anterior extremities are slender, and coloured above like the back, with spots and transverse bars of black, and dusky yellowish-white below; there are four long and delicate fingers. The posterior extremities are very long, and coloured both above and below like the anterior; there are five toes, but slightly palmated.

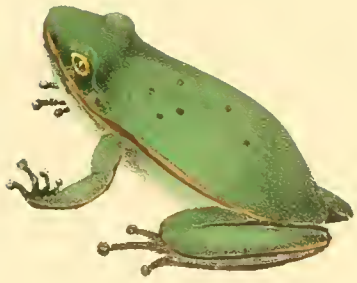
Dimensions. Length, $1\frac{1}{2}$ inches; of thigh, 8 lines; of leg, $8\frac{1}{2}$ lines; tarsus and toes, 10 lines.

Habits. But little is known of the habits of the Rana nigrita, but from the form of the posterior extremities and the arrangement of its toes it would seem to be a land animal, and closely allied with the Rana ornata.

Geographical Distribution. This animal has as yet only been found in Georgia and Carolina; Leconte observed it in the former state, and I have seen it in the latter.

General Remarks. Leconte gave the specific name nigrita to this animal in his "Remarks on the genus Hyla and Rana;"* and although he does not describe it in detail, yet the characters he assigns are sufficient at all times to distinguish this frog from all others, consequently his name must be retained.

* Ann. Lyc. Nat. Hist. N. Y., vol. i. p. 282.



Hyla viridis.

21.

Sera pinx.t

P.S Duval, Lith. Phil.a

HYLA VIRIDIS.

Plate XX.

Characters. Body above bright green, beneath yellowish-white, and granulated; a lateral line of straw colour extends from the upper jaw over the shoulder and along the flanks.

Synonymes. Green tree frog, *Catesb.*, Caorlina, &e., vol. ii. p. 71, pl. lxxi.
Hyla viridis, *Laur.*, Synops. Rept., p. 33, *variety* B.
Cinereous frog, *Penn.*, Arct. Zool., vol. iii. p. 42.
Rana arborea, *Gmel.*, Syst. Nat. Lin., *variety* B. vol. i. p. 1054.
Calamita cinerea, *Schneid.*, Hist. Amph., fas. i. p. 178.
Hyla lateralis, *Latr.*, Hist. Nat. Rept., tom. ii. p. 180.
Hyla lateralis, *Daud.*, Hist. Nat. des Rain., &c., p. 16, pl. ii. fig. 1.
Hyla lateralis, *Daud.*, Hist. Nat. des Rept., tom. viii. p. 27.
Calamita lateralis, *Merr.*, Versuch eines Syst. der Rept., p. 171.
Hyla lateralis, *Leconte*, Ann. Lyc. Nat. Hist. N. Y., vol. ii., p. 279.
Hyla lateralis, *Harl.*, Med. and Phys. Res., p. 107.

Description. The head is flattened; above it is of a bright grass green colour, as well as at the sides; the snout is obtuse; the upper jaw is green in front, but dull white behind. The nostrils are nearer the snout than to the orbit. The eyes are large and prominent, the pupil dark, with a beautiful golden iris; the tympanum is small, but very distinct, and green like the body. The body is stout and compressed, of a lively grass green, with occasional spots of brightest gold colour; a pale straw coloured line begins under the anterior part of the orbit, runs beneath the eye and tympanum, and is continued above the shoulder along the

flanks to near the posterior extremities; this line is partially visible on the posterior part of the upper jaw, giving it a whitish appearance. The throat is yellowish-white; the thorax silvery; the abdomen yellowish-white, and granulated.

The anterior extremities are coloured like the body above, white below, with a pale yellow line along the posterior border of the humerus, fore-arm and carpus, to the external finger; this line becomes very distinct only near the elbow; there are four fingers cleft, each ending in a rounded pellet, by which, the animal can sustain itself on smooth places. The posterior extremities are very long, and green on the upper surface; the thigh is yellow beneath, and granulated; the nates are flesh colour, with a few dusky spots; the leg is pale flesh colour below, with a yellow line before and behind, which is continued along the tarsus to the outer toe; there are five toes, fully palmated, the two external green above, the three internal dirty yellow, each terminates in a rounded pellet similar to those of the fingers.

Dimensions. Length from snout to vent, $1\frac{3}{4}$ inch; of thigh, 8 lines; of leg, $8\frac{1}{2}$ lines; of tarsus and toes, 1 inch 2 lines.

Habits. These animals are found on trees, but most commonly about the broad leaved plants, as the pontederia cordata, nymphæa, &c; they are also very numerous in fields of Indian corn, (zea maïs,) where they conceal themselves from their enemies by passing in between the broad green leaves of the plant, the colour of which is so nearly their own that it is not easy to find them. Here they remain quiet and motionless during the heat of the day, but in the morning or evening, or before a shower, they emerge from their hiding places and become very brisk and noisy. Their noise proceeds from a single note, which, at a little distance, is not unlike the sound of a small bell. There seems in general to be one leader of their orchestra, and when he raises his note, hundreds take it up from all parts of the cornfield, and when he stops, the concert is at an end, until he again begins. They feed on various insects, especially the common fly, which they seize with great adroitness, leaping a foot or more to secure it. At certain

seasons they may be seen on the ground on their way to pools of water; they are then exceedingly active, leaping at times ten or twelve feet.

Geographical Distribution. For the present we must set down latitude 33° on the Atlantic coast as the northern limit of the Hyla viridis; thence it extends through Georgia, Florida and Alabama to Mississippi, but I have no evidence of its existence further west.

General Remarks. The first notice of the Hyla viridis now under consideration is in Catesby's History of Carolina, &c.; he there calls it the green tree frog, and gives a very good detailed account of its habits, accompanied with a tolerably accurate drawing.

Linnæus seems to have regarded this animal as a variety of the common Rana arborea, which he says, incorrectly, however, inhabits both Europe and America.

The next account of the Hyla viridis is found in the Synopsis Reptilium of Laurenti, who first separated the genus Hyla from that of Rana. He called the tree frog of Europe Hyla viridis, and considered the tree frog of Catesby as a variety under the same name. Now, the specific name of viridis cannot be used for the tree frog of Europe, inasmuch as Linnæus and other Naturalists had previously imposed upon it that of arborea; and this leaves the specific name viridis unapplied, and consequently it may be used for our animal, as given it by Laurenti, who seemed to consider it as very distinct from the common tree frog of Europe; nor can there be any doubt of his meaning, for he refers expressly to Catesby's seventy-second plate of the second volume, saying, "Corpore tereti, linea, utrinque flava, sed recta, distinguitur clamore, tschit, tschit, tschit, dum nostro (Hyla arborea) clamat ra-ra-ra."*

The next account of the Hyla viridis is in the supplement to Pennant's Arctic

* Laurenti, Synops. Rept., p. 33.

Zoology, where it is described as the cinereous frog, with a white line along the flanks; the green colour doubtless had become cinereous, owing to the action of alcohol on the specimen which he examined.

Gmelin, in his edition of the Systema Naturæ, goes back to the opinion of Linnæus, and considers the Hyla viridis as only a variety of the Rana (Hyla) arborea; but he adds a reference to Catesby.

Schneider also calls it a variety of his Calamita arborea, though he says, "non solum linearum diversa disectio, sed vox etiam distinguit."

Bosc observed the living animal in Carolina, and gave a detailed and accurate account of it to Latreille and Daudin, under the name Hyla lateralis, which was afterwards published in their respective works. This name, however, cannot be retained in this work—that of Hyla viridis having the right of priority.

Bufo erythronotus.

20.

P.S. Duval Lith. Phila.

BUFO ERYTHRONOTUS.

Plate XXI.

Characters. Head short, rather pointed; body short and thick, brick-dust colour above, dirty yellowish-white and granulated beneath. Length, 1½ inches.

Description. The head is short, brownish-red above, with the superciliary ridges but slightly elevated and the snout rather pointed. The upper jaw is brown, with a few reddish-white spots; the lower jaw is white. The nostrils are small and near the snout, with a slight ridge extending to the front of the orbit. The eyes are very large and prominent, with a black pupil and bright golden iris, through which passes a black band. The tympanum is small, brown below and red above. The post tympanal glands are kidney shaped, and secrete a greyish-white fluid. The body is short, thick, and rounded, warty or granulated above, of Spanish brown colour, with a light vertebral line. The throat and chest are silvery-white, with small dusky spots; the abdomen yellowish-white, and minutely granulated.

The anterior extremities are small, pepper-and-salt grey above, with alternate transverse bars of brick dust colour and black; there are four fingers, distinct, and nearly of equal length, with a very large knob or wart at the carpus, and a smaller one beside it. The posterior extremities are short, and coloured like the anterior; there are five toes semi-palmate, the fourth longest; there are also two prominences, or warts, at the tarsus.

Dimensions. Length of body from snout to vent, 1½ inches; of thigh, 6 lines; of leg, 6 lines; of tarsus and toes, 6 lines.

Habits. This animal is found in the deep oak forests in the neighbourhood of Charleston, and is apparently rare, as in nine years I have not seen more than half a dozen specimens, consequently nothing can be said of its habits.

Geographical Distribution. As yet this animal has only been observed in South Carolina.

General Remarks. There is no doubt that this animal is an adult, though I was at first disposed to consider it the young of the large toad of similar colour mentioned by Bartram in his Travels in Florida, which as yet I have never seen. Subsequent observation has, however, convinced me to the contrary; for Bartram's animal weighed nearly a pound, while no specimen of the Bufo erythronotus exceeded one inch and a half in length; nor can it be the young of the Bufo lentiginosus, as the superciliary ridges are not elevated; or the young of the Bufo americanus, which is sometimes red, for this latter animal does not inhabit the low country of South Carolina; nor in fact is it the young of any animal, as might be inferred from its size, for I have seen the male and female together.

Salamandra salmonea.

22.

T.W.Hill pinx.t

P.S.Parrott Lith.

SALAMANDRA SALMONEA.—*Storer.*

Plate XXII.

Characters. Head large, flat; snout obtuse, with a salmon coloured line on each side to the orbits; body and tail yellowish-brown above; salmon colour, with a tinge of yellow at the sides.

Synonymes. Salamandra salmonea, *Storer*, manuscript notes communicated to me.

Description. The head is large and flattened above, with a broad, almost square snout; the nostrils are near its extremity, and far apart. The eyes are very prominent and large, the pupil deep black, the iris shining copper colour. The skin of the chin and neck is smooth, with a transverse fold.

The body is cylindrical and much elongated.

The anterior extremities are short and small, with four fingers, distinct, the second and third longest. The posterior extremities are twice the size of the anterior, and terminate in five toes, distinct, the third and fourth longest. The tail is longer than the body, thick and rounded at the root, compressed laterally, and pointed at the tip.

Colour. The head is yellowish-brown above, and salmon colour at the sides, with a very bright decurved salmon coloured line extending from the nostril to the superior part of the orbit of the eye. The upper jaw is pale salmon colour, with a few brown spots; the lower is nearly white, or palest flesh colour. The chin and throat are white. The upper surface of the body and tail is

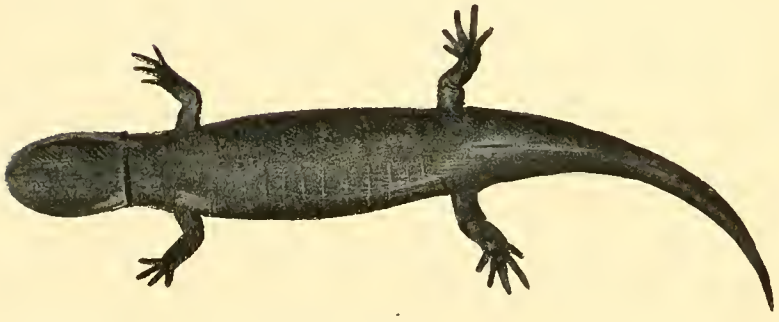
yellowish-brown, with greyish marks; the flanks and sides of the tail are salmon colour, with a tinge of yellow; the thorax and abdomen are white; the under surface of the tail is pale salmon colour. The anterior extremities are yellowish-brown above and clear white below; the posterior are of similar colour, both above and below.

Dimensions. Length of head to anterior extremities, 1 inch; body from anterior extremities to vent, $2\frac{1}{4}$ inches; tail beyond the vent, $2\frac{1}{2}$ inches; total, $6\frac{1}{2}$ inches.

Habits. But little is known of the habits of the Salamandra salmonea; it was found on land, in a moist situation, among the mountains of Vermont, by Dr. Binney, who kept it alive for nearly a year by feeding it on flies, which it devoured very greedily.

Geographical Distribution. For the present, I would put down Vermont and Massachusetts, as the only two specimens hitherto observed were found, one in the neighbourhood of Danvers, in Massachusetts, and the other at the Green Mountains of Vermont.

General Remarks. I have never had an opportunity of examining this animal alive, but can answer for the correctness of the drawing and colouring through my friend Dr. Storer, of Boston, to whom this description is due.



Salamandra fasciata.

23.

T.H.Gill pinx.

P.S. Duval Lith. Philada.

SALAMANDRA FASCIATA.—*Green.*

Plate XXIII.

Characters. Head short, broad; snout large and rounded; body and tail above palest ash colour, with irregular, transverse bluish-black blotches on the back, and bars on the tail; throat and abdomen indigo blue; tail length of body, compressed laterally and pointed at the tip.

Synonymes. Salamandra fasciata, *Green*, Jour. Acad. Nat. Scien. Philad., vol. i. p. 350.
Salamandra fasciata, *Harl.*, Med. and Phys. Res., p. 94.

Description. The head is large, short, thick, and rounded in front. The nostrils are lateral and near the snout. The eyes are very prominent, with the pupil black and the iris dark grey. The skin of the chin and neck is smooth, with a transverse fold in front of the anterior extremities.

The body is cylindrical and robust, smooth both above and below; the tail is thick, rounded on its superior and inferior surface, though a little compressed at the sides.

The anterior extremities are short and rather stout, with four fingers, distinct; the posterior are nearly twice the size of the anterior, and have five toes, the third and fourth longest.

Colour. The head is palest ash colour above, with two or three bluish-black blotches, the largest about the occiput; the upper jaw is bluish-black, and the

lower of similar colour, but lighter. The body is also palest ash colour above, marked with irregular blotches of bluish-black placed transversely, and the abdomen is uniform indigo blue; the tail is pale ash colour on its superior surface, and marked with transverse bars of bluish-black.

Habits. This is a true land Salamander, and one of the most beautiful of the genus; I have kept them alive for many months in a box filled with meadow moss, (sphagnum,) which was occasionally moistened; and it was remarkable that they always chose the superior surface of the moss for their resting place, while their fellow prisoner, the Salamandra venenosa, was always found deeply buried.

Geographical Distribution. Professor Green first observed this animal in New Jersey; Dr. Blanding afterwards saw it at Camden, in South Carolina; Dr. Binney very recently discovered it in Georgia; Professor Hitchcock found it in Massachusetts, and furnished my friend, Dr. Storer, of Boston, with the fine specimen from which the accompanying plate was taken; Dr. M'Murtrie says it is common in the neighbourhood of Philadelphia; in the western states, I have at this moment but one locality to give, Marietta, in Ohio, from which place Dr. Hildreth sent specimens to the Academy of Natural Sciences in Philadelphia; yet, doubtless, it is common throughout the west.

General Remarks. The Salamandra fasciata was first observed, and accurately described by Professor Green, of Philadelphia, who has done so much to elucidate the history of this obscure family of reptiles; and it is remarkable that so large and beautiful an animal should so long have escaped the observation of our Herpetologists.

Salamandra venenosa.

24

T. Ho. p. ad.

J. Duval Lith. Phila

SALAMANDRA VENENOSA.—*Barton.*

Plate XXIV.

Characters. Head moderate, snout slightly rounded; body and tail above bluish-black, with a row of round or oval yellow spots on each side from the head to the tip of the tail; under surface bluish-black.

Synonymes. Salamandra venenosa, *Bart.*, in Daud. Hist. Nat. des Rept., tom. viii. p. 229.
Salamandra subviolacea, *Bart.*, Trans. Amer. Phil. Soc., vol. vi. p. 112, pl. iv. fig. 6.
Salamandra subviolacea, *Harl.*, Med. and Phys. Res., p. 93.

Description. The head is of moderate size, with the snout a little more pointed than in the Salamanders generally; the nostrils are lateral and near the snout. The eyes are small, but prominent; the pupil black, the iris darkest grey. The skin of the chin and neck is smooth and cast into a large transverse fold. The body is elongated, but tolerably thick, and covered with a smooth skin. The tail is cylindrical at the root, soon becomes compressed laterally, and terminates in a point. The anterior extremities are small, and terminate in four fingers, all nearly of the same length; the posterior are larger, and end in five toes, the third and fourth longest.

Colour. The head is bluish-black above, with four or five round orange spots; a small one is at the back of each orbit, and another behind the temples; both the upper and lower jaw is black; the chin and throat are bluish-black. The whole superior surface of the back, as well as the tail, is black, with a row of yellow spots, round or oblong, on each side, extending to the tip of the tail. The thorax, abdomen, and under surface of the tail, are bluish-black. The superior surface of

the anterior, as well as the posterior extremities, is coloured like the back, and on both are one or two round yellow spots; their inferior surface is bluish-black.

Dimensions. Length of head to anterior extremities, 1 inch; of body to vent, $2\frac{1}{4}$ inches; of tail, $2\frac{1}{2}$ inches; total, $5\frac{3}{4}$ inches.

Habits. This is another land Salamander, passing most of its time in moist places, as under the trunks of fallen and decayed trees, or under rocks and stones, and only appearing abroad after showers of rain or at the dusk of evening in search of its food, which is small insects or earth-worms.

Geographical Distribution. The Salamandra venenosa is abundant at the north and west; Professor Green informs me that it is common near Albany; Dr. Binney has observed it in Vermont; Dr. Storer in Massachusetts; I have seen it among the White Mountains of New Hampshire, and Say has seen it in Ohio and Kentucky. For the present Maryland must be set down as its southern limit—south of that I have no evidence of its existence. Daudin, Harlan and others, speak of it as inhabiting South Carolina, and refer to the Salamander represented in the beak of the Ardea herodias of Catesby, which Say and other Naturalists consider as identical with the Salamandra dorsalis. Catesby's animal, however, is neither the one nor the other, but a different species, and probably peculiar to the south, as I have only observed it about the Sea Islands of South Carolina.

General Remarks. The history of our acquaintance with the Salamandra venenosa is as follows: In 1803, Dr. Barton obtained a living specimen from the neighbourhood of Philadelphia, which he presented to the American Philosophical Society, accompanied with a description and figure—under what specific name does not appear, for I have consulted the records of the Society, and they simply state that a paper of this kind was read by Dr. Barton, and referred to a committee, consisting of Latrobe and others. Now, it is probable that Latrobe, or perhaps Dr. Barton himself, might have given some account of the

animal to Rafinesque, or that he (Rafinesque) might have been present at the reading of the paper, for it is certain that he sent a good description to Daudin, who published it in his work under the name it now bears, which was probably given by Barton, and communicated through Rafinesque to Daudin, for the latter gives the specific name, as imposed by Barton. Six years after, Dr. Barton published his account of the same animal in the sixth volume of the Transactions of the American Philosophical Society, under the name Lacerta subviolacea, from its colour. It would appear, however, that the specific name venenosa is the appropriate one, at least so far as regards priority, as it was first published by Daudin, with a reference to Barton, who had no right to change a name, even though imposed by himself, after it had been once published to the scientific world.

Salamandra tigrina.

25.

Ridl. pinx.ᵗ

F. S. Mural. Lith. Paderb.

SALAMANDRA TIGRINA.—*Green.*

Plate XXV.

Characters. Head large, snout rounded; body elongated, bluish-black, with irregular lemon coloured blotches; tail longer than the body, greatly compressed at the sides, sharp both above and below, and coloured like the body.

Synonymes. Salamandra tigrina, *Green*, Jour. Acad. Nat. Scien. Philad., vol. v. p. 116.
Salamandra tigrina, *Harl.*, Med. and Phys. Res., p. 93.

Description. The head is large, broad, flattened above and rounded in front. The nostrils are lateral and near the snout. The eyes are large and prominent, the pupil black, the iris golden, reticulated with brown. The neck is contracted; the chin is smooth, and the throat has a transverse cuticular fold.

The body is robust and cylindrical; the tail is longer than the body, and compressed at the sides so as to offer a narrow margin above and below.

The anterior extremities are short and thick; there are four fingers, short, distinct, and all nearly of the same length. The posterior extremities are larger than the anterior, and have five toes each.

Colour. The whole superior surface of the animal, head, neck, body, tail, as well as the extremities, is bluish-black above, marked with irregular spots and blotches of lemon colour. The chin is dusky yellow; the throat and abdomen are

cinereous, with blotches of dusky yellow; the inferior surface of the tail and extremities are clouded yellow.

Dimensions. Length of head to anterior extremities, 1 inch 2 lines; of body to vent, $2\frac{1}{4}$ inches; of tail, $3\frac{1}{2}$ inches; total length, 7 inches.

Habits. This animal, at first sight, appears to be somewhat allied to the Salamandra venenosa in the general arrangement of its colours, but it is found, on closer examination, to be widely different, as may be seen in their respective descriptions, by which one will be found to be a land, and the other a water animal.

Geographical Distribution. This species of Salamander inhabits the northern states from New Jersey to Massachusetts.

General Remarks. This animal is also one of those observed and accurately described by Professor Green.

Salamandra longicauda.

SALAMANDRA LONGICAUDA.—*Green.*

Plate XXVI.

Characters. Head short; body elongated, lemon coloured above, and marked with small, irregular, oblong, or round black spots; tail more than twice the length of body, compressed at the sides, and marked with transverse black bands.

Synonymes. Salamandra longicauda, *Green*, Jour. Acad. Nat. Scien. Philad., vol. i. p. 351.
Salamandra longicaudata, *Harl.*, Med. and Phys. Res., p. 96.

Description. The head is short, and the snout obtuse; the nostrils are lateral and near the snout. The eyes are small, but prominent, the pupil black and the iris golden. The chin and neck are smooth, with a slight cuticular fold at the throat. The body is cylindrical, small and delicate. The tail is twice the length of the body, compressed at the sides, and exceedingly thin and slender.

The anterior extremities are rather long and slender; there are four delicate fingers, distinct, and all nearly of the same length. The posterior extremities are nearly twice the size of the anterior, with five distinct small toes.

Colour. The head is lemon colour above, and the chin and throat nearly the same. The body above is of similar colour, with numerous small irregular black spots; the thorax and abdomen are yellowish-white. The tail is coloured like the back, but here the black spots are lengthened into transverse bars. The anterior, as well as the posterior extremities, are similar in colour above to the back, below they are straw colour.

Dimensions. Length of head, 7 lines; of body to vent, $1\frac{3}{4}$ inches; of tail beyond the vent, $3\frac{1}{2}$ inches; total, 5 inches 10 lines.

Habits. This animal is aquatic in its habits, and is among the most beautiful of our Salamanders, with its slender body and enormously long tail, which it moves gracefully from side to side when it swims.

Geographical Distribution. The Salamandra longicauda is found in most of the northern parts of the United States. Dr. Smith has seen it in Massachusetts; Professor Green has observed it near Albany, and at Princeton, New Jersey; and Dr. Pickering informs me that they are found in the neighbourhood of Pittsburg, west of the Alleghany mountains.

General Remarks. This is another of our Salamanders observed and first described by Professor Green, of Philadelphia.

Salamandra erythronota.

27.

P.S. Duval Lith. Phil.ª

SALAMANDRA ERYTHRONOTA.—*Green.*

Plate XXVII.

Characters. Head short, snout obtuse; body cylindrical, with a broad reddish-brown vertebral band from the snout to the end of the tail; flanks yellowish-brown; abdomen white; tail shorter than the body, tapering and pointed.

Synonymes. Salamandra erythronota, *Green*, Jour. Acad. Nat. Scien. Philad., vol. i. p. 356.
Salamandra cinerea, *Green*, Loc. cit., vol. i. p. 356.
Salamandra erythronota, *Harl.*, Med. and Phys. Res., p. 95.
Salamandra cinerea, *Harl.*, Loc. cit., p. 95.

Description. The head is short, the snout rather pointed; the nostrils are lateral and near the snout. The eyes are small, but very prominent; the pupil black, the iris copper-colour. The skin on the chin and throat is smooth. The body is cylindrical and slender; and the tail round at its root, and terminating in a point. The anterior extremities are very delicate, and terminate in four fingers, the inner one very short; the posterior are much larger, and end in five toes, distinct, the internal as well as the external very short.

Colour. The head above is reddish-brown, the upper and lower jaw tinged with yellow. The back is marked with a broad vertebral band of reddish-brown, which extends to near the tip of the tail; below this the flanks are yellowish-brown, as well as the sides of the tail. The anterior and posterior extremities are yellowish-brown above. The whole inferior surface of the animal, body, tail and extremities, is dusky-white.

Dimensions. Length of head to anterior extremities, 4 lines; of body to vent, 1 inch 2 lines; of tail beyond vent, 1 inch 2 lines; total length, 2 inches 8 lines.

Habits. This is entirely a land animal, and is found under rocks and stones, and decayed trees.

Geographical Distribution. The Salamandra erythronota is, perhaps, the most common species in the northern states, from latitude 44° to 39°; it is abundant in the neighbourhood of Boston and Philadelphia; and if it be identical with the Salamandra cinerea, of which I have no doubt, then is its range very extensive, for Dr. Blanding has seen it as far south as Camden, in South Carolina, and Say as far west as Louisville.

General Remarks. The Salamandra cinerea is no doubt identical with the Salamandra erythronota—its form, its proportions, its habits and localities, are precisely the same, being often found in company under the same stone; its colour is the same, except in having only a small remnant of the reddish-brown vertebral band, or in wanting it altogether, which may be the result of old age. Dr. Green, who first described the Salamandra cinerea, has, by further investigation, come to the conclusion that these two species are identical; and in this he is supported by Dr. Pickering. I have never had the opportunity of examining these animals alive, as might be desired.

To Professor Green belongs the merit of having first observed and described the Salamandra now under consideration; for although he believed it was only a variety of an animal described by Rafinesque, yet he informed me that Rafinesque afterwards told him that the Salamandra erythronota was not the animal he (Rafinesque) had in view, and which, indeed, he had published, under some other name.

Salamandra auriculata.
28.

SALAMANDRA AURICULATA.

Plate XXVIII.

Characters. Head small, with a reddish-brown spot near the ear; body and tail cylindrical, with a series of minute reddish-brown spots on each side.

Description. The head is small, rounded above and in front. The eyes are prominent, but small; the pupil is black, the iris reddish-brown. The nostrils are small, lateral, and are wider apart than in the Salamanders generally. The neck is slightly contracted, with a small cutaneous fold at the throat.

The body is long and cylindrical; the tail is long, round, but slightly compressed at the tip.

The anterior extremities are small, with four fingers, of which the third is the longest. The posterior extremities are also small, but thicker than the anterior; they each terminate in five toes, of which the third is the longest. Both fingers and toes are destitute of nails.

Colour. The Salamandra auriculata is dusky-brown above, rather darker upon the head, with an oblong reddish-brown spot behind the ear. On each side of the body is a row of small and sub-round reddish-brown spots, extending as far as the extremity of the tail; these spots on the flanks frequently are double, but very closely approximated. The throat and abdomen are light grey, with a tinge of violet at the throat.

Dimensions. Length of head to anterior extremities, 6 lines; of body to vent, 2 inches; of tail, $2\frac{1}{2}$ inches; total length, 5 inches.

Habits. Nothing is known of the habits of this animal.

Geographical Distribution. The specimens from which the above description was taken came from Riceborough, in Georgia, and were furnished me by my friend Dr. Harden.

Salamandra talpoidea.

Rogers, pinx.t

P.S. Duval; Lith. Phil.a

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SALAMANDRA TALPOIDEA.

Plate XXIX.

Characters. Head very large; body short, thick, clumsy; tail short, thick, compressed. Colour above dusky, almost black; beneath dusky, with a tinge of purple.

Description. The head is very large and flattened, the snout full and rounded. The nostrils are near its extremity. The eyes are exceedingly prominent, but small; the pupil black, the iris dusky. The neck is contracted, and with a marked cutaneous fold at the throat.

The body is short, thick, clumsy, rather flattened than cylindrical, and covered with a smooth skin. The tail is short, very thick at the root, and compressed laterally throughout its whole extent.

The anterior extremities are short, thick, and stout, ending in four short fingers. The posterior extremities are still stouter in proportion, and terminate in five short unarmed toes.

Colour. The whole animal above, head, body, tail and extremities, is of a uniform dusky colour, approaching to black. The throat, belly and tail are also dusky, but have a strong tinge of purple.

Dimensions. Length of head, 5 lines; of head and neck, 7 lines; of body, 1 inch 3 lines; of tail, beyond vent, 1 inch 3 lines; total length, 3 inches 1 line.

Geographical Distribution. The only locality I have at present for the Salamandra talpoidea, is the sea islands on the borders of South Carolina, where it was discovered by Mr. Burden, one of my pupils.

General Remarks. The habits of this animal are not a little curious, as it burrows in the ground like a mole, where it seems constantly to dwell. It chooses light soil for its residence, and, if disturbed, it will bury itself in a few seconds, and then continue its course concealed from view; but its track can be followed by the slight elevation produced on the surface of the soil, similar to that seen in fields infested by moles. This animal bears a strong general resemblance to the Salamandra atra of Austria.

Menobranchus lateralis

50

J. Bowman pinx.t

P.S. Duval, Lith. Philad.a

MENOBRANCHUS.—*Harlan.*

Genus Menobranchus.—Characters. Head large, flattened, truncate; two rows of teeth to upper jaw, a single row to lower; teeth small, conical, pointed; gills and tail persistent during life.

MENOBRANCHUS LATERALIS.—*Say.*

Plate XXX.

Characters. Head large, flattened, snout truncated or slightly emarginate; body elongated, cylindrical; tail compressed, ancipital; anterior extremities with four fingers, posterior with four toes; skin smooth, dusky-brown, with a black vitta extending from the nostril through the eye, continued more indistinctly along the side, and terminating on the tail.

Synonymes. Proteus of the lakes, *Mitchell*, Amer. Jour. Arts and Scien., vol. iv. p. 181, also vol. vii. p. 63.
Triton lateralis, *Say*, Long. Exped., vol. i. p. 5.
Monograph of doubtful animals, *Barnes*, Amer. Jour. Arts and Scien., vol. xi. p. 268.
Proteus maculatus, *Barnes*, Amer. Jour. Arts and Scien., vol. xiii. p. 68.
Menobranchus lateralis, *Harl.*, Med. and Phys. Res., p. 89.

Description. The head of the Menobranchus lateralis is large, broad, and flattened above; truncated and almost sub-emarginate at the snout. The nostrils

are lateral and very near the margin of the upper lip. The eyes are small and far asunder, with the pupil as well as the iris of dark gray. The mouth is large, reaching to the eyes; the lips are thick and fleshy; the tongue is broad, entire, and full at the tip; there are two rows of small conical pointed teeth in the upper jaw, and one only in the lower. The neck is contracted, and has a cutaneous fold at the throat. There are three rows of external gills on each side, placed on the posterior margins of corresponding fleshy prolongations, and supported by three branchial arches, between which are two apertures or openings apparently for the transmission of water: "these gills are exceedingly minute, and resemble fringe of the finest texture."

The body is elongated, cylindrical, and covered with a smooth, soft skin, permeated by many pores. The anus, or vent, is a longitudinal fissure. The tail is long, broad, ancipital, and rounded at its extremity like that of an eel.

The anterior extremities are placed behind and near the gills; they are short, thick, and terminate in four fingers, destitute of nails. The posterior extremities are nearly of the same size as the anterior, and terminate in four unarmed toes.

Colour. The head above, as well as the whole superior surface of the animal, is dusky-brown; from the nostrils extends a black vitta through the eye along the flanks, but here less distinct, and finally becomes obsolete on the tail. The inferior surface of the Menobranchus lateralis at the throat and abdomen is dirty flesh colour, darker at the tail.

Dimensions. Length of head, $1\frac{1}{2}$ inches; breadth, $1\frac{1}{4}$ inches; length of body to vent, 7 inches; of tail, beyond the vent, $3\frac{1}{2}$ inches; total length, 12 inches. They sometimes reach the size of more than two feet.

Habits. The Menobranchus lateralis lives in general at the very bottom of the waters it inhabits; there it swims or creeps along the ground with a slow and serpentine motion; rarely, however, it leaves the water and creeps to the shore.

Its food is the various univalve shells, &c. Dr. Mitchell says he has found in the stomach of the Menobranchus lateralis, individuals of the Lymnæa heterostropha, and also crustaceous animals of the Oniscus family. It is frequently caught by the hook when baited for eels or catfish, (silurus,) "though little desired by the fishermen, who believe it to be poisonous, and hold it in such abhorrence as seldom to take it in hand even to disengage it from the hook when caught."

I have never seen this animal alive, yet have every reason to believe the accompanying drawing very accurate, as it was done from life, and under the direction of my friend Professor Troost; besides, it corresponds in general with the description of the living animal, as given by Professor Benedict to Mr. Barnes: "The gills are of most rich crimson, and these the animal keeps in constant motion as a fish does the gills; in bringing them down to the neck, the filaments are brought pretty close to the fleshy fimbriæ; on elevating them, the fimbriæ dilate and float as it were in the water, presenting from the beauty of their colour and gracefulness of their motion an appearance beautiful beyond description."

Geographical Distribution. The Menobranchus lateralis is found in most of the great northern lakes, as Erie, &c. At Lake Champlain they are common, and are said to be numerous in Onion river, one of its tributaries, especially at the falls, near Burlington, in Vermont. Say found it in the Alleghany river, and it abounds also in many other of the western waters, as I am informed by Troost.

General Remarks. There can be no doubt that this animal was first described by Schneider;* indeed his description is too good to be mistaken; he says he found

* Pervenit eo ex Americano lacu Champlain dicto transmissum, ubi captum cum piscibus timent ceu venenatum piscatores. Corpus ultra 8 pollices longum et fere pollicem crassum, molle, spongiosum, multis poris pervium, in utroque latere tribus macularum rotundarum, nigrarum seriebus variegatum: cauda compressa et anceps, utrinque maculata, inferiore acie recta, superiore curvata, in finem teretiusculum terminatur. Caput latum et planum: oculi parvi, nares anteriores in margine labii superioris, maxillae superioris geminae ut inferioris dentes conici, obtusi, satis longi; lingua lata, integra, anterius soluta: apertura oris patet usque

it in the museum of Professor Helwigg, at Brunswick—that it came from Lake Champlain—that it was reputed as poisonous by the fishermen, &c. &c., though he regards it as a species of Siren.

This animal is next mentioned in the work of Daudin,* who very erroneously considers it as the young or larva of the Menopoma alleghaniensis.

Dr. Mitchell next gave a very good description of it in Silliman's Journal, under the name "Proteus of the lakes."

Say considered it as a Triton, and first applied to it the specific name lateralis, from the black vitta along the side of the head and body. The name is well enough for the western animal, but is certainly very inappropriate to the same animal found in the great northern lakes, which wants the dark vitta entirely, its place being supplied with large dusky spots, such as in the individual described by Schneider. This difference of arrangement of the colours, as well as the difference in geographical distribution, makes a well marked variety, named by some "maculatus," yet it is doubtless the same animal, and must be described under the same name, though not perfectly appropriate.

Since Say's description of the animal, Mr. Barnes, aided by Professor Benedict, has published an accurate and highly interesting account of the Proteus lateralis.†

ad oculorum lineam verticalem: labia piscium labiis similia: pedes dissiti quatuor, tetradactyli omnes, absque unguiculis: ani rima in longitudinem patet: Branchiae utrinque ternae extus propendent, appositae superne totidem arcubus cartilagineis, quorum latus internum tubercula cartilaginea, velut in piscium genere, exasperant, &c. &c.

* Hist. Nat. des Rept., tom. viii. p. 271.

† Vide Amer. Jour. Arts and Scien., as referred to above.

END OF THE THIRD VOLUME.